THE RUBBER AGE

JANUARY 10, 1920 VOL. VIII. NO. 7

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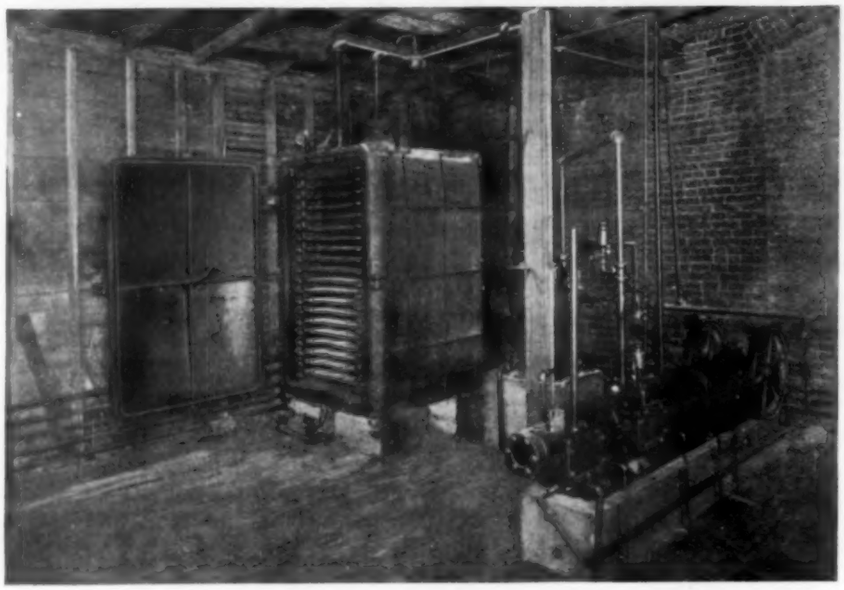

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VOL. VIII JANUARY 10, 1921 No. 7

The Action of Heat and Light on Vulcanized Rubber

By John B. Tuttle

Some of the destructive agencies causing the deterioration of vulcanized rubber are heat, light, air, oils, etc. Of these heat and light are probably the most serious, and they are so frequently spoken of together that not only the general public, but many rubber technologists as well, have come to believe that their action is essentially the same, whereas, as a matter of fact, this is far from the truth. The causes of this deterioration are referred to quite casually, the favorite explanation being "oxidation" and "depolymerization," applied alike to either the action of heat or of light.

The purpose of this paper is to bring together some facts which may enable us to define more clearly the effect on vulcanized rubber caused by heat and light.

A Chemical Reaction

The reaction between unvulcanized rubber and sulphur is now generally recognized to be a chemical one, involving the addition of sulphur at the double bond. We therefore expect that the speed of the reaction will vary with a change in temperature. The familiar phenomenon of "burning on the mill" shows that local heating in spots is sufficient to produce a marked effect, even though the average temperature is much below the normal vulcanization range. Probably all rubber chemists have experienced the hardening or "burning" of compounded rubber during storage, especially when it is piled up while it is still quite warm from milling. In the presence of certain accelerators, such as the dithiocarbonates partial vulcanization may take place at room temperatures in 24 to 48 hours.

Vulcanizing Data

These are well known facts, and show that it is not necessary to reach the ordinary vulcanizing range, (say between 275 and 300° F), to effect the union of rubber and sulphur. A compound containing 94 per cent smoked sheets, and six per cent of sulphur, can be vulcanized in two or three days at 212° F, the product, however, being of decidedly inferior quality with low tensile strength. At 20 pounds steam pressure (259° F), a good cure is usually obtained in about eight hours, while at 40 pounds, (287° F), the best cure is found in the neighborhood of 90 to 120 minutes. Of these, the best product is obtained at 40 pounds, thus showing that at the same time the reaction between rubber and sulphur is taking place, a different reaction occurs simultaneously, which brings about a degradation of the quality of the vulcanized product.

From these facts, it is apparent that vulcanization is the chemical addition of sulphur to rubber, the speed of the reaction depending upon the temperature, and the nature of the catalyst present. When only rubber and sulphur are present, the speed of reaction at ordinary temperatures is practically zero, and with a few exceptions, this is also true with most accelerators.

Vulcanization is therefore a matter of three steps, forming a complete cycle; (a) zero speed of reaction in the raw stocks; (b) high speed of reaction during vulcanization; (c) a return to zero speed of reaction after vulcanization. To effect proper vulcanization, it is necessary to find the temperature at which the quickest cure, consistent with safe manufacturing practice, can be obtained, and stopping the process when the desired point is reached. In molded articles, this is accomplished by quick removal from the molds; in larger articles, such as tires, the method of drenching with cold water when the specified time has elapsed, is followed. The purpose of the drenching is to reduce the speed of reaction to zero, or very near that, and if the cooling is not sufficient, obviously the combination of rubber and sulphur must go on, even though at a much lower speed, and hence an overcure must result. From 30 to 40 minutes at 220 to 230° F has been known to overcure tires which had previously received what was known to be the correct cure. Pans of cured rubber articles were stacked up, one on top of another, and allowed to remain in this position until cool. With the exception of the contents of a few outside pans, the material was overcured, simply because having once obtained the correct cure, no effort was made to stop the reaction at that point.

Low Temperature Necessary

After the proper vulcanization has been obtained, and the reaction stopped by sufficient cooling, rubber products must be kept at the lowest possible temperature, to prevent further reaction between the rubber and sulphur. In warehouses, the commonest causes for higher temperatures are found in exposed steam pipes, radiators, and windows which are exposed to direct sunlight. While chemists are familiar with these facts, they are not so well known to others, and the result is that there is considerable deterioration caused by improper storage. After the rubber products have left the manufacturers hands, there is still danger that articles which were properly made, may be ruined by exposure to elevated temperatures. The vast bulk of the rubber industry today is in the manufacture of tires. In this country, the custom of carrying spare tires on the rear of automobiles is well night universal. The author has made extended observations on the condition of these spare tires, and has noticed that in a large number of cases, the heat from the exhaust strikes the lower part of the tires, raising the temperature to a point much higher than that of the rest of the tire. In a number of cases, the discoloration of the tread or sidewall was abundant evidence that after-vulcanization had taken place. The drying of raincoats, overshoes, hot water bottles, etc. by placing them over steam radiators, and the consequence thereof, is too common to require comment.

Principal Physical Change

The principal physical change in vulcanized rubber, when exposed to sunlight, is "cracking" or "checking," which is of course accompanied by a lowering of the tensile properties. This action is dependent, to a large extent, on the composition of the compound. Some unpublished tests, performed while the author was associate chemist at the United States Bureau of Standards, throw some light on this phase of the subject. About 40 samples of inner tubes were exposed to direct sun-

Published by courtesy of the American Chemical Society. Paper read at the meeting of the Rubber Division, Chicago, September 1920.

light. Of these, about twenty-five were red tubes, and the balance gray. With two or three exceptions, all of the red tubes showed a very rapid checking, whereas the gray tubes showed a much higher average degree of resistance. This property is not inherent in the color, for later on, one of the red tubes which had shown a high resistance to checking, was tested against a new sample of gray tube, and the latter showed serious checking after only four to six hours exposure, whereas the red tube was in good condition after several weeks exposure. These tests were performed outdoors in the winter time, and the temperature seldom rose over 50° F, so that we may safely assume that these changes were the result of the sunlight only.

If the action of heat and light is the same, we would expect that the chemical and physical properties would vary alike, the difference, if any, being in amount and not in kind. We have seen that heat produces an after vulcanization, resulting in the lowering of the tensile properties. Sunlight also reduces the tensile properties, so that we must look elsewhere for differences in their behavior.

In studying the chemical deterioration, we may use the method of change in solubility of the rubber substance in such solvents as acetone, alcohol, chloroform, etc. In the study of the effect of heat and light on balloon fabrics, (1) there was little increase in the amount of acetone soluble material after heating in the dark for 28 days at 70° C, although the physical appearance of the samples showed that a marked change had occurred. Some of the fabrics were so hard as to crack when bent. These same fabrics, when exposed to weathering, showed an increase in acetone extract as the rubber substance decomposed. Some fabrics increased from an initial extract of 2 per cent to 20 per cent after 15 to 30 days exposure, and all samples showed an increase in extract in time.

Increase in Acetone Extract

This same phenomena has been observed in other tests on balloon fabrics, made since the publication of the tests just referred to. It has been noted that as long as the rubber retains its original tensile properties, there is very little change in the acetone extract, but after a certain point is reached, which may be termed the end of the useful life of the material, a sharp break occurs in the solution curve, after which there is a rapid increase in the percentage of acetone extract. This same behavior was noted in the natural aging of rubber, and was reported to the Rubber Section of the American Chemical Society at its meeting in New York in September, 1916. The samples under observation were rubber bands, and a very rapid increase in acetone extract was noted after reaching the point where the bands began to become hard and brittle. These samples were stored in a cool, dark place, at a temperature which probably did not exceed 25° C at any time of the year.

It is probable that this increase in acetone extract is a true case of oxidation, the reaction being accelerated by sunlight. There seems to be considerable evidence that the speed of this reaction is increased tremendously by the presence of any appreciable quantity of oxidized rubber. It has been noted time and time again that there is little change in solubility during the early stages of deterioration, but that after it has once set in the rate shows a marked increase. This is true, irrespective of the time required for the sample to go through the so-called "early stage of deterioration." Rubber bands containing reclaimed rubber showed this break in the curve at a much earlier point than the bands which contained only new rubber. It seems quite possible that the presence of products of oxidation act to increase the rate of further oxidation. This is quite in line with the well known reaction between $KMnO_4$ and oxalic acid. The first few drops of permanganate require an appreciable time before decolorization takes place, but from this point on to the exhaustion of the amount of oxalic acid in solution, the decolorization is instantaneous.

Another important difference between the action of heat and sunlight, is that while the former acts throughout the entire mass the sunlight is essentially a surface change, although after it is once started, it rapidly travels to the center. It is worth noting that while the deterioration, when exposed to sunlight, brings about an increase in the percentage of acetone extract, the shape of the curve is influenced by the thickness of the test pieces; the very thin ones such as we have in balloon fabrics, showing a much more rapid increase than thicker test pieces. The difference between the action of heat on thin and thick test pieces, is much less marked, showing that the reaction occurs throughout the mass, and such differences as do occur may be easily explained on the basis of the heat conductivity of the rubber.

(1) Third Annual Report, National Advisory Committee for Aeronautics.

Summary

It is shown that the action of heat and sunlight is entirely different in nature, the former being largely an additional period of vulcanization, caused by the increase in the speed of the reaction between sulphur and rubber, whereas the latter is a true case of oxidation, with the oxidized rubber acting to produce a rapid increase in the rate of solubility of the rubber substance in acetone and similar solvents.

Rubber Production in the Late German Colonies

Prior to the war the German Colonies in Africa were making considerable strides as rubber producers. The export from the Kameruns amounted to 1,517 tons in 1909; 1,962 tons in 1910; 2,708 tons in 1911; and 2,810 tons in 1912; the last two figures including 11 tons and 24 tons respectively of plantation rubber. "German East" shipped in 1909, 256 tons of wild and 228 tons of plantation rubber; in 1910, 329 tons of wild and 414 tons of plantation rubber; in 1911, 172 tons wild and 684 tons plantation rubber; and in 1912, 1,053 tons of plantation rubber. Adding in the small production from Togoland, the total exports for the three Colonies were 2,148 tons in 1909, 2,840 in 1910; 3,708 tons in 1911; and 4,028 tons in 1912. We are unable to trace any large exports of rubber from these countries in recent years. The shipments from Togoland may however be given:—

1914.	1915.	1916.	1917.	1918.	1919.
Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
nil	8	41	64	2	78

And we gather that 172 tons from the Tanganyika Territory (late German East Africa) found their way to the coast, and were shipped in 1918-1919. As regards the Kameruns, the ports from which wild rubber is shipped are in the French sphere, and no particulars seem to be available. Exports of plantation rubber from the British sphere during this period have been very small, viz., about 3 tons in 1918 and 7 tons in in 1919. It was recently reported that the Administration of the Tanganyika Territory had decided to put up for auction the enemy plantations, particularly those of sisal, coffee, rubber, and coconut. It now appears that for some reason or other the sale is to be indefinitely postponed, despite the facts that this delay entails severe hardship on many of the prospective buyers, protracted idleness in the plantation industry, and consequent lack of employment for native labor.

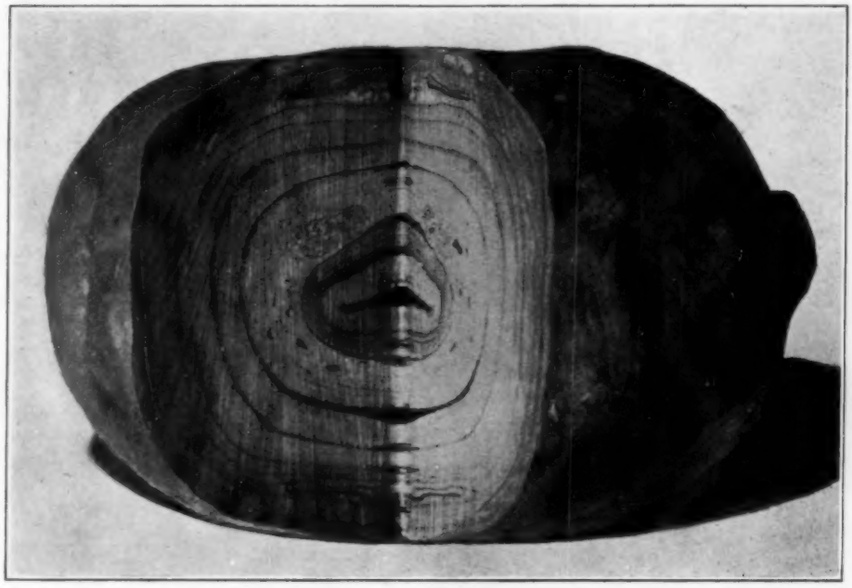
Rubber Exports from Brazil in in November

Total shipments of crude rubber from Brazil and from Iquitos, Peru, during November, 1920, amounted to 3,148,442 pounds, Europe receiving 1,689,606 pounds and the United States 1,458,836 pounds, compared with total exports of 7,676,442 pounds in November, 1919. Shipments of the various grades from Para and Manaos, Brazil, and Iquitos, Peru, to the United States and Europe during November of the current year are given in the appended table.:

Grades.	From Para, Brazil, to—		From Manaos, Brazil, to—		From Iquitos, Peru to—	
	United States	Europe.	United States.	Europe.	United States.	Europe.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Fine	316,793	560,381	441,351	447,290	120,290	19,775
Medium	11,050	38,710	46,184	31,565	703	2,158
Coarse	223,682	33,326	119,344	49,127	11,746	4,388
Caucho	48,067	418,315	115,116	69,742	4,510	14,829
Total ...	599,592	1,050,732	721,995	597,724	137,249	41,150

The Beginnings of Plantation Rubber

The following article tells the story of the rubber plantations in the Far East the development of which paralleled the development of the automobile industry in the United States and Europe.



CUT SECTION SHOWING LAYERS IN A BISCUIT

Through one of those mysterious coincidences so nicely timed that they are regarded by many as a distinct act of Providence, there was set in motion in the early seventies two separate activities which were to coalesce more than a generation later and make possible the great automobile industry of America and the attendant tremendous expansion of the rubber and petroleum industries.

One of these activities was the effort of Selden to produce an autobile engine. Here was the inception of what has been termed the most gigantic mechanical enterprise of the ages. It took many years for the flower to bloom; but from the day of those first experiments the advent of the automobile was constantly imminent.

As if the unseen forces that guide human affairs were fully cognizant that within a brief period this effort of Selden's was to blossom fully in the great automobile industry of today, another man in another quarter of the globe, and with no thought of the automobile in mind, took at about the same time, the steps which have made it possible to furnish for that industry the large supplies of rubber on which automobiles are so vitally dependent.

What the automobile would be without rubber tires would be hard to imagine. Without rubber, some autobiles would undoubtedly be manufactured, but they would certainly be rattlebang affairs of slow speed and much vibration. It is quite true that following the invention of a successful engine automobile development has been conditioned very largely upon the development of tires. This fact is amply demonstrated today, through the revolutionary changes taking place in motor truck construction due to the adaptation of the pneumatic tire to use on motor trucks. Germany had a chance to find out what automobile operation without rubber tires was like during the war, and she did not relish the experience.

It is the purpose of this article to show how it happened that when the automobile industry burst upon the world, with a need for rubber which the recognized sources of supply could not have begun to meet, there was found ready in a new quarter, a supply so adequate that the progress of the industry has not been halted for a second by any shortage of rubber. In other words, this is the story of the rubber plantations in the Far East.

Until a decade ago rubber meant rubber from Brazil. There were some other sources of supply of inferior grades, but practically all the prime rubber came from Brazil. Today Brazil's supremacy is gone. In less than a decade, the Far East has jumped to the front, and is now producing nine-tenths of the rubber of the world.

PRUNING YOUNG RUBBER TREES ON SUMATRA PLANTATION

The history of the passing of the glory of Brazil in this particular, has a touch of romance in it. In the sixties, an Englishman named Wickham spent much time in Brazil in the rubber field. He conceived the idea that the rubber trees which grow wild in Brazil could be cultivated and grown on plantations. But he was ahead of his time, and found little encouragement.

Wickham finally enlisted the interest of Sir Joseph Hooker of Kew Gardens, London, who had been considering the possibility of introducing the trees to India. Hooker in turn interested the government of India in the project, with the result that Wickham was given a commission by the Indian government for the introduction of the Brazilian tree into India.

How to fulfill the commission was the problem. Hooker had already tried to effect it, but without result

in spite of the resources of Kew. Wickham was in Brazil when the solution of the problem suddenly presented itself. A large British steamer which had sailed up the Amazon on her first trip with a cargo of goods to be sold—it being the intention to load her from the proceeds with rubber for her return trip—found herself without funds and without a cargo, when the supercargoes, after disposing of the goods she had brought decamped with the money. Wickham promptly chartered her in the name of the Indian government, and placed aboard her at a port a third of the way up the river, several thousands of the seeds of the Hevea Braziliensis, the rubber tree, carefully packed.

"For my part," says Wickham in his memoirs, "as the fine ship sped on her way with my precious Hevea, so far safe aboard, slung up fore and aft in their crates in the roomy,empty forehold, I became more and more excreised and concerned with a new anxiety.

"We were bound to call in at the city of Para as the port of entry, in order to obtain clearance papers for the ship before we could go to sea. It was perfectly clear in my mind that if the authorities guessed the purpose of what I had on board, we should be detained on a plea for instructions from the Central Government at Rio, if not interdicted altogether. I had heard of the difficulties encountered in the Clements Markham introduction of quinine trees into India in getting them out from the Montana of Peru. Any such delay would have rendered my precious freight quite valueless and useless.

"But again fortune favored. I had a 'friend at court' in the person of Consul Green. He quite entered into the spirit of the thing, went himself with me on a call to the proper official, and backed me up as I presented to His Excellency my difficulty and anxiety, being in charge of, and having on board a ship anchored out in the stream, exceedingly delicate botanical specimens, especially designated for delivery to Her Brittanic Majesty's own Royal Garden of Kew. Even while doing myself the honor of thus calling on His Excellency, I had given orders to the captain of the ship to keep up steam, having ventured to trust His Excellency would see his way clear to furnishing me with immediate dispatch. An interview most polite full of mutual compliments in the best Portugese manner, enabled us to get under way as soon as the captain had got the dingey hauled aboard.

"I got the captain to put me ashore at Havre, and then posted over to Kew and saw Sir Joseph Hooker, so as to dispatch a night goods-train to meet the ship on arrival at the Liverpool docks."

Sir William Thiselton-Dyer speaks interestingly of the next step:

"I can assure you that on that 14th of June, 1876, when Mr. Wickham arrived at Kew in a hansom cab with his precious box of seeds, not even the wildest imagination could have contemplated its result. I saw Mr. Wickham's seeds planted. We knew it was touch and go, because it was likely the seeds would not germinate. I remember well going into the propagating house on the third day they were planted, and seeing that by good luck the seed was germinating. So rapidly did the plants grow—several thousand of them—that we had to have special cases made. On August 12th, thirty-eight cases went out to Ceylon on a P. & O. steamer, in charge of a gardener. The whole expense of initiation and the whole burden of finance from first to last, was borne by the India Office."

The seedlings were sent to Ceylon because it was decided that the climate of the island was better suited than that of India for the rearing of the precious trees. The gardens at Heneratgoda, sixteen miles from Colombo, were opened as their permanent resting place.

Plantation Rubber in Storage

The first tree flowered at Heneratgoda in 1881, and in that year the first experiments in tapping began. The plantation was thinned out in 1882, and in 1883 two hundred and sixty seedling plants were raised, most of which were distributed in Ceylon. In 1884 there were over a thousand trees at Heneratogda, but it was found necessary to thin the plantation again in 1885, and we read of four hundred fifty-seven fine trees existing in 1887. In 1893 about ninety thousand seeds were distributed to planters in Ceylon and similar numbers were disposed of in the years immediately succeeding, the seeds being eagerly taken up at a price of ten rupees about $3.20 a thousand.

From the few plants thus cared for in their youth, many of which have now grown to be monster trees, has sprung the whole of the Ceylon industry, as well as a great part of that existing further East.

In 1877 twenty-two trees reared in Ceylon were sent to Singapore in Malaya. Some were planted in the Singapore Gardens, and the rest taken to Perak. Some of these original trees are still standing, and one of them is believed to be the biggest tree in girth yet recorded among the plantations. The trees fruited in Singapore first in 1881, and the seed was sent to Borneo and elsewhere. In 1891 samples of Malay rubber were sent to London and pronounced good, and in 1889 some sheets were sold in London.

The planters in Ceylon did not take hold of rubber planting with the same eagerness as did the planters of Malaya. In Ceylon they were making good profits in tea growing, and had no need to make a change. But in Malaya the planters, and the financial interests in Europe who had sent them out, were sick to death of the struggle to make a living out of coffee.

It was very difficult at first to induce planters in Malaya to look with favor on cultivation. Trees were planted wherever possible. At length, the sudden rise in the price of rubber, mainly due to the development of the automobile industry, forced the idea of cultivation on the attention of the planters and the investing public, especially that of Great Britain. A few pioneers began to cultivate their trees; and in a few years there arose a boom in cultivation, such as has never occurred in any other industry.

(Continued on Page 276)

Golden Anniversary for B. F. Goodrich Co.

The shriek of whistles, the clang of bells, and the usual din of merrymaking at midnight on December 31 meant more to Akron than the birth of another year—it marked the golden anniversary of the B. F. Goodrich Rubber Company, the pioneer rubber factory of the "Rubber City". Fifty years ago that day, the company was incorporated by Dr. Benjamin Franklin Goodrich and nineteen Akron men who "risked" $1,000 each in the new venture.

Inasmuch as the growth of Akron during the past two decades has been caused directly by the rapid expansion of the rubber industry, the anniversary had real significance to the people of the city. They felt duly grateful to the man who was instrumental in bringing the industry to the city and who thereby paved the way for its future growth.

The rubber industry, combined with the all-powerful automobile industry, literally made Akron, lifted it out of obscurity and placed it on a plane with the foremost manufacturing centers in the United States. Twenty years ago, when both the rubber and automobile industries were still in their infancy, Akron only had a population of 47,000. The last census showed it had grown to almost a quarter million.

The B. F. Goodrich Rubber Co. occupies a pioneer rank in the automobile industry along with Haynes, Duryea, Apperson, Selden, Winton, Ford and the Dodge brothers. Goodrich is said to be the oldest large company in the industry.

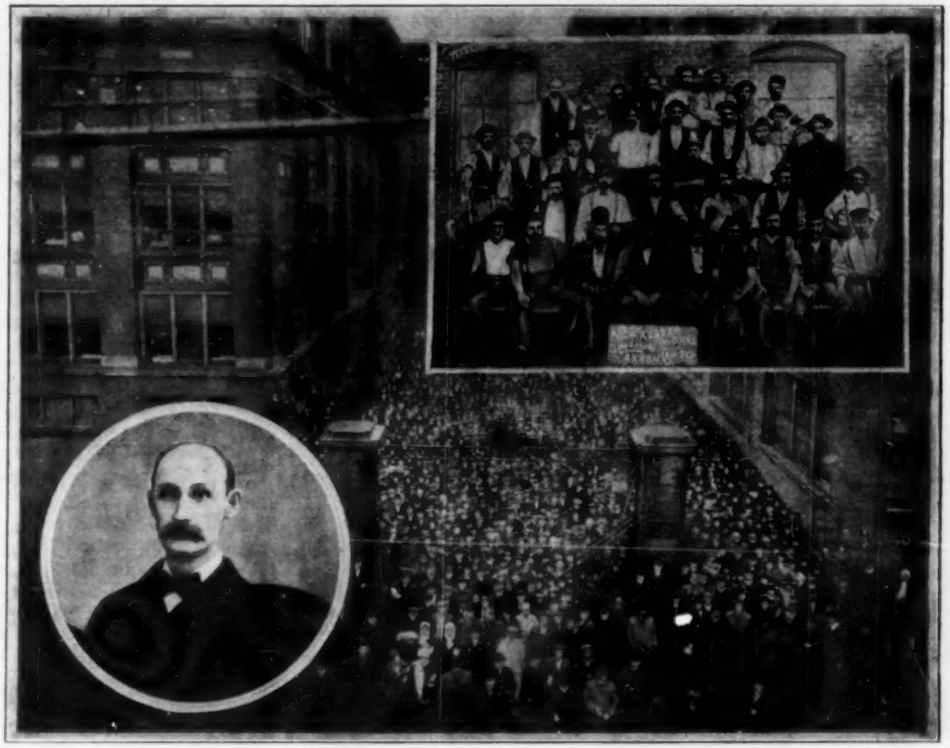
It is interesting to note that although Dr. Goodrich's work in developing rubber products was destined to figure prominently in the successful growth of the automobile industry, he did not live to see a "horseless carriage". He died August 3, 1888, several years before the first real automobile was made in this country.

Dr. Goodrich, who was a physician by profession, acquired a small rubber factory at Hastings-on-the-Hudson, N. Y., in a real estate deal. As a result of a quest for financial help, he finally came to Akron and located in a small two-story brick building with a force of twenty-five employes. This little factory of fifty years ago has grown until today it comprises sixty-three buildings of brick and steel, covering 110 acres of ground.

When Dr. Goodrich built his factory in Akron, the field for the use of rubber factories was limited. The growth of the organization was therefore a story of pioneering. Dr. Goodrich himself was looked upon as a visionary—and so he was, but above all he was a worker, striving to make his vision a reality. "Let us make goods destined for service," was the simple principle he often voiced.

The first product Goodrich ever made was fire hose. Article after article was then added to its list of manufactured goods until today approximately 30,000 rubber products are made.

Beginning as the company did with the manufacture of fire hose and mechanical goods, the next step in its growth came with the development of the bicycle, for which Goodrich developed pneumatic tires. Before this period, however, the company had taken the initial step in the evoution of rubber shod wheels by perfecting the solid rubber tire for carriage. The success of this tire, followed by that of the pneumatic tire for bicycles, naturally led to consideration being given for tires for automobiles. With the universal use of the motor car today, it is difficult to realize that as short a time ago as 1896 Goodrich produced the first American clincher type pneumatic tires for automobiles.



Some of the B. F. Goodrich Co. Workers
Dr. B. F. Goodrich Factory Force in 1870

Present Plant of B. F. Goodrich Co., Akron, Ohio

Year after year showed steady improvement in the methods of manufacture as well as the service of the tires themselves and led up to the pioneering in America of the cord tire by the Goodrich Company. The modern cord tire was evolved from the Palmer bicycle tire which utilized the principle of parallel threads or cords in place of woven fabric. While the patents were owned by J. M. Palmer of England, Goodrich manufactured them exclusively in the United States for a number of years. Later when Palmer sold his patents to a rubber company in Silvertown, England, the American rights under these patents were acquired by the Goodrich company in 1912. Many changes and improvements in construction and method of manufacture of this type of tire have been made during the past ten years but the original cord pneumatic tire idea for bicycles has been the fundamental principle throughout.

Many of the men who have contributed to the company's development are still active on the official board. There have been but three presidents: Dr. Goodrich was succeeded by G. T. Perkins, who was followed by the present chief executive, B. G. Work, son of Alanson Work. The roster of vice presidents exhibits a similar continuity of organization. Since the inception of the company the vice presidents have been Alanson Work, G. T. Perkins, G. W. Crouse, H. C. Corson, B. G. Work, F. H. Mason, A. H. Marks, H E. Raymond, E C. Shaw, C. B. Raymond, W. A. Means, H. K. Raymond, W. O. Rutherford, W. C. Geer and A. B. Jones. The company has had but six secretaries—G. T. Perkins, H. C. Corson, R. P. Marvin, C. B. Raymond, Guy E. Norwood and F. C. VanCleef. The treasurers have been G. T. Perkins, H. C. Corson, W. A. Folger, W. A. Means, and L. D. Brown.

In the golden anniversary message of greeting to employes and thousands of customers throughout the country, President B. G. Work said in part: "We feel a thrill of pride as we look back over the years and realize the part we have played in the development of the rubber industry."

The Goodrich company is commemorating the anniversary by publishing a forty-eight-page book called the "Golden Year of Goodrich," telling of the romance of the rubber industry, its history, and of what importance it has been in the progress and development of the world. The book was written by Wilbur D. Nesbit and illustrated by W. T. Benda, the famous Polish-American artist.

The Beginnings of Plantation Rubber

(Continued from Page 274)

The plantation product first attracted serious attention in the manufacturing world about 1898; but it was not until 1905 and the two following years that the rush into rubber took place, which forms the most striking episode of this story.

To show how lightly the plantation product was regarded by European and American rubber manufacturers, it is only necessary to state that it took from 1900 to 1904 for the annual production of plantation rubber to grow from 4 tons to 43 tons. In 1907 the output reached 1,000 tons, in 1911, 14,500 tons, in 1915, 107,800 tons and in 1919, 285,225 tons. In comparison, the Brazilian output grew from 27,136 tons in 1900 until it reached its maximum of 42,410 tons in 1912, since which time the annual output has averaged about 35,000 tons.

The Romance of Plantation Rubber

The romance of plantation rubber, is the old, old story, a few resolute men working in eastern jungles, having faith in the ultimate success of the work they had undertaken, and that of those daring to put their capital into faraway lands. It was but a few years ago that practically all the planters were feeling acutely the pinch for funds to tide them over the early stages of the enterprise. Many cases could be cited where fifteen years ago $25,000 to $50,000 could not be found to carry on estates being planted in rubber, which are valued today at four to five millions.

When a market for plantation rubber began to develop, the needy planters were astounded at the fabulous estimates of profits which they figured out of their estates, and dared not present them to financiers until they had divided the probable profits by four. Even then, these estimates appeared in the light of a fairy tale, and London financial men shrugged their shoulders, buttoned up their pockets, and thought they had done a good day's work when they had got rid of the importunate planter and his castles in the air.

When the estimated profits began to be fulfilled, the British public rushed madly to secure an interest in every venture placed before them. They were as anxious to risk their money to get a share of the wonderful profits, as are Americans today, to part with their Liberty Bonds, in order to partake of visionary dividends in alluring oil ventures. Conditions became such that respectable newspapers refused to carry any advertisements of rubber projects.

The excitement culminated in the historical and regrettable "boom" of 1910. By good fortune, the bubble was deflated without bursting, and now the financial affairs of the plantations are on a very substantial basis.

The area of plantation rubber in acres was 116,500 in 1905. In 1919 a fairly accurate estimate placed the acreage at 2,910,750. While Europe—and especially England—was devoting its attention to the growing of crude rubber, America was concerning itself with the production of rubber manufactures, and the success of the European investment in plantations has been a direct resultant of the enormous market created for rubber by the energy of American manufacturers.

American interest was attracted to the plantation industry in 1910, when the British and other Europeans had invested between three and four hundred millions dollars in estates. The United States Rubber Company, the largest consumer of crude rubber in the world, was one of the first of the American concerns to investigate the possibilities and enter the field. The Dutch island of Sumatra was chosen for the company's activities. This American corporation has established there the largest single rubber plantation in existence. The tract contains more than 70 square miles of trees in a high state of cultivation and close to twenty thousand employes are at work in the great orchard. The high standard of administration and scientific culture which have marked this project have implanted in the minds of the dwellers in that far eastern clime a thoroughgoing respect for American efficiency.

While the eight million cars of the United States skim along on their tires made of plantation rubber, one cannot but pause to wonder again at the curious coincidence that has made it possible to furnish in abundance the necessary rubber.

Few of the planters who embarked in the early days on the plantations venture had even heard of the automobile, when they set out their trees. Those who had kept in touch with affairs in England might have heard of the horseless carriage preceded by a man on foot carrying a red flag as a danger signal, but none of them realized that this object of England's merriment was the forerunner of the great automobile industry of today.

South American Rubber Exports

The leading rubber-producing countries in South America are Brazil, Bolivia, and Peru. For the majority of these countries the latest figures of exports available are those of 1918:—

Exports from	Tons. 1909.	Tons. 1910.	Tons. 1911.	Tons. 1912.	Tons. 1913.
Brazil	39,026	38,546	36,547	42,286	35,861
Bolivia	3,052	3,117	3,645	4,079	5,143
Peru	2,802	2,650	2,491	3,192	2,781
	44,880	44,313	42,683	49,557	43,784
	1914. Tons.	1915. Tons.	1916. Tons.	1917. Tons.	1918. Tons.
Brazil	31,713	31,550	28,865	31,589	22,210
Bolivia	4,485	5,055	4,916	5,843	4,286
Peru	2,272	3,400	2,810	3,294	1,736
	38,470	40,005	36,591	40,726	28,232

A Publicity Program for the Rubber Industry

The suggestions herein presented are taken from a memorandum prepared for the Rubber Association of America by a publicity specialist who has had a broad experience in the field of cooperative educational (publicity) work for industrial groups.

This outline is drawn up after only a casual look into the situation of the rubber industry. Its points, of course, would be subject to change or elimination according to conditions as they are found after a careful survey. However, any industry dependent on popular consumption would be benefitted by a plan of action similar to that outlined herewith.

The publicity work should include not only matter designed for publication in the press but any goodwill or promotion work directed at the ultimate consumer and done in close cooperation with the manufacturing and sales branches of the industry. The work would be conducted under supervision of the Rubber Association of America, and through it have touch with the industry as a whole.

Promoting the Interests of Rubber

The prime motive of such a campaign obviously would be to promote the interests of rubber as a material for manufacture, in no matter what form, with the result of increased tonnage production. Directly, the publicity would tell of the romance of rubber and thus create an interest in the public mind in rubber as a manufacturing material; how grown, refined and manufactured. It would point out rubber's place in modern life, the home, machinery, wearing apparel and call attention to the superior merits of rubber for many purposes.

This work, properly conducted, should rehabilitate rubber products in any field where they may have been allowed to stand still or lose ground; aid in developing new uses for rubber; help the manufacturer and retailer in their individual exploitation by laying a favorable ground work for their advertising and sales promotion, and generally to increase demand for articles made of rubber.

The results of all this work by no means would be immediate, but of a gradually constructive nature. The histories of association advertising campaigns show that three years is the usual period for intensified effort; that after the first year results begin to appear but that only after the lapse of the second year is the accumulated effect of the publicity apparent.

Publicity, that is unpaid matter of various kinds, often is even slower in working although its benefits may be immediate but not at once perceptible because of the slow journey between an idea in the head of the ultimate consumer and increased production for the manufacturer. In such work where an entire industry is concerned the distant future should be considered, even the incoming generation. While no money should be squandered on too far-sighted endeavor, pains should be taken to lay a sound foundation for the future solidarity of the industry. The same effort that would accomplish this would be of immediate benefit as well.

The cost of the publicity would involve only the salary of a publicity man and the expenses incidental to the preparation and distribution of copy.

Joining Association Effort with Individual Company Publicity

Association work should in no way interfere with the advertising or publicity program of the member-companies because it would have no relation to trade-marked products, exploiting merely the merits of rubber clothing, raincoats, overshoes; rubber appliances for the household (where it appears there is a vast field for new product development); rubber heels and soles, and, in a peculiar sense that will be dealt with later, automobile tires. Each company would be left free to exploit the peculiar merits of its products, while anything said in benefit of rubber articles in general would make for the betterment of the industry as a whole. At the same time the association publicity work should be conducted with due care so that no bias could be created to the detriment of any one company-member or to the betterment of any one so that the others by contrast. would be injured.

The publicity work in benefit of the whole industry not only would add to the sum-total of publicity for rubber but could enter fields where the companies are now barred. Publicity for an industry is not unwelcome to editors of newspapers and magazines if it has news value or literary merit, while equally good matter in the interest of a trade-marked article would be refused because of conflict with the advertising department.

The association publicity should come into the good will created by the advertising of the individual companies. The companies would profit by the general publicity in the same ratio they now profit by individual publicity. For illustration, at present a maker of rubber coats that does not advertise profits indirectly by the rubber coat advertising of another maker. But the name of the maker that advertises is first in the public mind and his advertising pays. So any publicity for rubber coats in general would benefit the maker that does not advertise to a degree and the maker that advertises to a larger degree, in proportion to his own publicity efforts.

The idea back of such a program as this would be to fill in the gaps in the publicity and advertising as conducted by the various companies which by the nature of the situation they themselves cannot do without expenditures for the benefit of all that would be better philanthropy than business.

Experiences with Cooperative Publicity in Other Industries

Publicity and advertising for an industry is relatively a new and thus far highly successful field. The Joint Coffee Publicity Committee within two years increased the consumption of coffee to a remarkable degree in this country in a campaign waged in the interests of Brazilian growers, and in the face of a falling-off in tea consumption. The American Face Brick Association in the first year will have increased the output of face brick manufacturers by fifty per cent, opposing a dull building industry. The California Raisin Association and the California Fruit Growers' Exchange have succeeded in rescuing their industries from utter destruction and in planting them on a sound basis. And there are many cases of successful campaigns for trade-marked articles that were alone in the field where equally good results were obtained. Of a dozen such campaigns recently investigated only one was a failure, that of the National Coal Association. It failed because the producers and dealers had not prepared for the increased demand that the publicity caused.

The aluminum utensil industry took itself out of ruin and became supreme in the kitchen through good-will work among housewives in a campaign, however, conducted by one manufacturer whose efforts saved the others.

Most of these campaigns relied on paid advertising of an educational and informative nature, backed by such free publicity space as could be obtained. But in no case were the company-members heavy advertisers, and the work in most cases took the form of rehabilitation of an industry gone to seed or menaced by an aggressive competitor.

Advertising by the Rubber Industry

On the contrary, in the case of the rubber industry the members are heavy advertisers and the industry of necessity has the good will of the magazines and newspapers. This leaves the field for publicity work for the entire industry of a sort that no one company could or would care to undertake. Publicity for automobile tires, for example, would have the good-will of the publications because the various tire companies are heavy advertisers, and readable matter is always acceptable where there is no particular make of article mentioned.

The chief object of most association publicity campaigns

has been to increase tonnage consumption with the producers of the crude product behind the movement, but the results proved manifold. The publicity created a good will on the part of the public and retail dealer that will last for a generation; it opened new fields overlooked in the daily routine of the manufacturer and it developed new articles of manufacture. It also made for a standardization of the industry that aided the dealers in raw products in judging the sources of demand, and throughout it created a new spirit of cooperation in matters for the common good of the industry and a confidence in the usefulness of the statistical and research work carried on by the association, which often for years had been unable properly to function because of trade rivalries in matters where rivalry was detrimental to the industry as a whole and of no benefit to the various companies, each of which, it developed, had been guarding as trade secrets matters known and similarly guarded by every other member.

Publicity for Tires

The publicity work should be divided sharply between tires and other manufactured articles, because tires keep apace in the same ultimate proportion, with the automobile industry and are a necessity to automobiles. Other articles have no limitation to their consumption and are not dependent on the fortunes of any other industry. Hence, publicity for tires should take the form of good-will work; to explain the manufacturing achievements, the improvements since the advent of the automobile, the decreasing cost per mile, the part the tire plays in the good roads movement, etc. All this should be done in cooperation with the National Automobile Chamber of Commerce so as to prevent duplication and conflict and to work for the betterment of the automobile industry itself. It obviously would be futile and ridiculous merely to tell people to use rubber tires on automobiles. industry itself.

Publicity Covering General Rubber Goods

The publicity for other manufactured articles would be more aggressive with the idea of causing the use of rubber where other materials are now used, and at the same time good-will work for the industry by telling of the achievements of American rubber manufacturers, the improvements in rubber products in the last decade and the mysteries of vulcanizing and of all the myriad things made of rubber and how essential it is to modern life.

Already rubber's usefulness in the home is demonstrated in articles for which there is no substitute, and it is familiar to everybody for its peculiar elastic and waterproof merits. Aside from any new products, certainly many articles already manufactured are not in common use, such as rubber pads for the kitchen for dish drying, rubber bath mats which if attractively made should be much more practical and economical than the textile ones now in general use and many other things where the contact of water makes a corrugated rubber surface of value. Most women, now doing their own housework because of the servant shortage, know that rubber gloves will defend the beauty of their hands, and it might be interesting to learn how extensively rubber gloves are used in the kitchen and how strongly they are pushed by the stores. Feminine vanity should make such promotion easy.

Of particular value would be the fact that the rubber manufacturing industry is distinctly American, both in development and control; that it is all-American and world-wide in its usefulness.

This general publicity would be directed at the trade papers where good-will was needed, such as the garment publications, hardware and technical magazines, and, where sufficient copy merit was possible, at the daily press and magazines of popular circulation. Special emphasis should be laid on the small-town and rural press, which could be used through the boiler plate services, because those fields are reactionary in their tendencies and not as prone to use new articles as the metropolitan districts.

The publicity work, in its pure sense, should not be pushed at first too strongly because of the danger of creating a reaction on the part of the editor and the public against having something in the form of news pushed on him. The stories should be "planted" judiciously and with only a slight effort toward "boosting," the motive, rather, being to tell something interesting with the "boost" for rubber a matter of inference. The mere word "rubber" if repeated often enough would help the industry.

Reference Library—General Educational and Promotional Work

Of equal importance would be informative and constructive publicity work. A library of books dealing with rubber growing and manufacture should be assembled, and if there are not proper books of reference in existence they should be written or the data assembled and mimeographed for distribution among members of the industry. For example, of prime importance would be a glossary of rubber and tire terms, American and English and some few in German, French and Spanish, with ample definitions so that a layman could use the work for ready reference. This would tend to standardize technical terms, prevent misunderstanding with the industry and especially in export trade. Such a work could be promoted by soliciting the interest of authorities in this country and in Europe who would act as an editorial staff. The work could be published at little or no expense because a book publisher would have a good field within the industry, the automobile industry, technical schools, libraries, etc. The book would be issued under auspices of the Rubber Association and have no more reference to individual manufacturers than, perhaps, a list of trade-marked products that would be of value for reference.

Interesting exhibits of rubber growing and manufacture for schools, technical and grammar, could be assembled at small cost and lectures prepared for the use of teachers, and prizes offered for the high school students writing the best essay on the use of rubber in the home. One of the most subtle and effective means of getting publicity is through the child, who, once interested, becomes an ardent propagandist.

It appears there should be new uses for rubber in the home that have been overlooked, and a school essay contest would be sure to turn them up, for the child's mind operates in a peculiarly inventive way.

Many of these problems could be met through the medium of attractive pamphlets. Facts about rubber and its use in every day life, household hints, simple truths about the merit of rubber, its care and repair all could be written into a booklet for distribution by manufacturers through retailers directly into the hands of housewives. A more technical pamphlet could be prepared for the use of salesmen, who dearly love to show their knowledge. One of the great faults of the modern merchandising system is the ignorance of the salesman of the merits of the goods he sells; the materials of which they are made and how they should be used and preserved.

Such pamphlets also should be directed at an elimination of the fallacies in the salesmen's and public's mind that militate against rubber products; that tires, overshoes, etc., of all rubber would wear better than those made with a fabric base, that rubber contaminates water, that rubber is a short-lived material, etc., etc. Such arguments also could be woven into matter prepared for the press.

Growth of Reference Work

The reference work would grow in importance and prove of great benefit to the various companies who might thus have a central bureau of information about points of fact, historical, technical and otherwise for the use of their advertising and technical departments. No attempt would be made, however, to deal with facts concerning new processes of manufacture, rivalry in trade fields or anything that might interfere with the individual effort of each company. Such an information bureau would be open to the public, and schools, universities, libraries and business organizations apprised of its existence. But if this work was undertaken it should be done thoroughly and ultimately would require the employment of a reference librarian. The salary of a reference librarian, if necessary to the work, would not be great, and would be worth the money in view of the direct returns in service to the companies. It also would be highly important to the working of the entire scheme. The librarian would have charge of assembling and indexing all nature of information about rubber in the same way that records are filed in a newspaper "morgue". The only extraordinary expense would be the printing and distribution of the educational pamphlets already mentioned, but this would not approximate the cost of advertising.

NEWS OF THE INDUSTRY

News -- Personals -- Financial -- Building Activities -- New Products

Prospects for the New Year

Col. Samuel P. Colt, of the United States Rubber Co., Reviews the Business of the Past Year Discusses the Outlook for 1921

The year 1920 has been an eventful one in the rubber industry along with the general business of our country. During the first half of the year most everything was on a high plane of inflation which had been in steadily increasing progress since the armistice. The peak was not reached until after the middle of the year, since which time the rubber business has been on a descending scale and prices of commodities entering into the manufacture of rubber goods have receded more rapidly even than they advanced, so that to-day crude rubber, cotton fabrics and other supplies, are selling for less than half what they were six months ago and in many instances below the cost of production. The decline in securities has likewise been drastic.

We know from experience that the pendulum swings too far in each direction and I believe that the rubber business, along with other lines, will gradually reach a healthy plane which will be satisfactory to both producer and consumer.

The Surplus of Rubber

The curtailment of manufacturing in the United States during the last six months of 1920, together with the fact that Central Europe and Russia are still in no position to absorb any large quantities of crude rubber, has produced a surplus of this commodity which has resulted in abnormally low prices. Every grade of rubber is to-day selling at figures well under the cost of production.

In the early part of the year just passed, it was generally estimated that the consumption of crude rubber in the United States alone would amount to nearly 300,000 tons, and it was the optimism reflected in this estimate which led many manufacturers to buy forward at prices which, based on past precedent, then looked low. Just what the actual consumption of crude rubber in the United States has been during 1920 it is difficult to estimate accurately, but at the maximum, it has not exceeded 225,000 tons.

It is still more difficult to estimate the stocks of crude rubber which will be carried over. A normal amount in the United States would be perhaps 75,000 tons, whereas there probably was on January 1, 1921, in all hands, from 100,000 to 125,000 tons.

Should prices continue below the cost of production for any length of time, it will necessarily materially decrease the world's production of crude rubber, and what will ultimately have an even greater effect, it will almost stop new planting.

The price of crude rubber (first crepe) in 1920, has ranged from 55c high to 16½c low, the latter being the present price. Before the opening of rubber plantations in the East, $1.50 was about the average price of Para rubber, the price of which now is 18½c.

In the footwear field, due to the unprecedented war demands, as well as the extreme weather conditions of last year, the capacity of the industry has been absorbed in 1920 without undue accumulation of stocks and it is believed that with even moderately favorable weather conditions, the volume of business in 1921 will be at least normal.

The demand for mechanical rubber goods was excessive during the first nine months of the year, but the efforts on the part of the industry to reduce inventory has caused a slackening of that particular branch of the rubber business during the past three months of the year, which condition will probably continue during the early months of 1921, but it is confidently expected that during the year there will be considerable demand caused by the liquidation that has been going on of visible stocks.

With the slowing up of industry, the automobile manufacturers especially felt the curtailment, and there was an overproduction of pneumatic tires which with the necessity for reducing dealers and manufacturers' stocks has demoralized the trade, but not, I think, to the extent generally supposed. Those companies, however, whose principal product is tires (which is not the case with the United States Rubber Company) have suffered most. We, however, already see some improvement in the tire trade.

Future of the Tire Business

Those who take a despondent view of the tire business for 1921, I feel, fail to realize the large proportion of automobiles that are used for business purposes and the relatively small number for pleasure. The latter may be largely curtailed, and doubtless will be, but the former are a necessity, and with the development of our highways, now in progress, are bound, in my opinion, to steadily increase.

To meet hard times one may wear their old clothes for several years, but they cannot run their automobiles or auto trucks on bare wheels and, therefore, must either abandon them of purchase tires. I would predict that there will be more tires consumed in the year 1921 than there were in 1920 or in any previous year in the history of the world.

The export business of the country and of the rubber industry has suffered from the world-wide general depression as well as from particular conditions which effect it, but do not affect domestic business. The continued high and increasing value of the United States dollar, with the necessary corresponding increase in the selling price of American goods in foreign countries and the scarcity and occasional complete lack of exchange have put a burden upon the export business, which has made it extraordinarily difficult to finance and require an excessive amount of capital, difficult in many cases to obtain.

Foreign Trade

I am, however, optimistic as to the future of our foreign trade and the ultimate restoration of new levels in exchange, which while far from normal will be reasonably steady and permit the interchange of goods with foreign countries. Indeed, a continuation of our foreign trade is essential, not only to the comfort and welfare of those nations with which we trade, but to our own as well. It will afford an outlet for our surplus production, greatly increased by the war demands. It must be maintained in order to continue the operation of plants, which otherwise would be forced to curtail with inevitable corresponding increase in unemployment of labor.

Automotive and Industrial Exposition

Announcement has been made that the board of directors of the Motor and Accessory Manufacturers Association has sanctioned the Northwestern Automotive and Industrial Exposition to be held in Minneapolis, Minnesota, from February 5th to February 12th, inclusive. The show will be housed in the mammoth new buiding of the Northwest Terminal Company. This is conveniently located and adapted for a show of large proportions.

Preliminary indications point to a record breaking demand for space at this show from the parts, units, and accessory manufacturers affiliated with the Motor and Accessory Manufacturers Association. The dominant position of Minneapolis in relation to the Western and Middle Western automotive markets, makes this show of unusual significance and value to the industry.

News from the Rubber Metropolis

Good Export Business for Coming Year Predicted—Hetzell with Knox Tire & Rubber—Ely Opens Law Offices—Mason Branch Changes—Akron Stock Prices

Predicts Good Export Business

(Special Akron Correspondence)

The advent of the new year in the Akron rubber manufacturing district brought with it many indications of a resumption in activities at the many tire plants in and around the city.

Owing to general unemployment the country over, no advance notices are given out of resumption of work in any department. There are many reports, however, that the Akron factories are planning to put more men to work this month and to increase the working hours of those now employed.

Another piece of cheerful news was brought to Akron recently by Henry G. Lubke, export manager of the General Tire & Rubber Co., who has just returned from a five months' business trip through all the principal continental countries. He predicts sales of American tires and other rubber products for the coming year in quantities that will not be far behind the marks established in 1920.

Contracts closed for the exportation of the local rubber concern's products has necessitated plans for increased production on the part of the General Tire & Rubber Co., Mr. Lubke stated. They are expected to be put into effect immediately following the first of the year and will require the employment of additional men.

Though one of the smaller rubber industries of the city, the company ranks as one of the leading tire companies in the country in the exportation of tires. Much of its business is done among foreign nations and Mr. Lubke announced that the contracts closed on his recent trip assures the local concern of practically its maximum foreign business.

The export representative was optimistic for the immediate future of Europe and stated that comparatively, most of the countries, excepting Germany, appeared to be in better shape than the United States. The readjustment is being brought about satisfactorily, he said, and there is far more optimism displayed than exists in this country today.

As in this country, according to Mr. Lubke, many of the war industries which started with only a name, have gone to the wall, but all of the old well financed corporations have withstood the period of readjustment and are well situated.

It is only the question of indemnity that is holding back the readjustment in Germany, according to Mr. Lubke's viewpoint. He stated that when the amount of the indemnities which Germany must pay is definitely settled the nation will rapidly turn toward somewhat normal conditions.

Products of American rubber companies continues to maintain its lead over foreign products, he said, and competition from other countries is practically negligible. A strong fight, however, is being waged to capture European business but the American concerns are emerging with honors, especially as regards the rubber business, he said.

The General Tire & Rubber Co. is expected to announce its plans for increased production shortly. Though production, with the start of the new year is expected to be speeded, it is said, that no new men will be employed, but that the old employes will be given the preference.

Hetzell with Knox Tire

The Knox Tire & Rubber Company announces that it has secured the services

A. S. Hetzell

of A. S. Hetzell as general sales manager. Mr. Hetzell is well known in tire circles throughout the country, having been associated with the old Diamond Rubber Company for a number of years and with the Republic Rubber Company for the last four years. The Knox Tire & Rubber Company of Mt. Vernon, Ohio, is one of the newer rubber companies located in the Ohio district.

Ely Opens Law Offices

Albert L. Ely, formerly in charge of the patent department of the Firestone Tire & Rubber Co., Akron, Ohio, has opened offices in connection with the law firm of Herberich, Burroughs & Smith, on the eighth floor of the Herberich building, Akron. Mr. Ely announces that he will specialize in the practice of patent and trade mark law exclusively at the above address.

Mason Branch Changes

George V. Armstrong, formerly with the Cincinnati branches of the Ajax Rubber Co. and the Kokomo Rubber Co., is now with the Cincinnati branch of the Mason Tire & Rubber Co., and will cover a part of Ohio with headquarters at Portsmouth.

The Kansas City, Mo., branch has been augmented by the addition of J. R. Beasley, who will cover southwestern Kansas; W. H. Burns, central western Missouri and A. J. Anderson, northwestern Missouri. The Cleveland branch reports additions in the persons of John H. Barnhart, who will cover western New York and northern Pennsylvania; and D. D. Connors, who will tour the Zanesville, Ohio, section.

The San Francisco branch also has a number of additions to its staff. P. H. Hart, formerly of the Des Moines, Iowa, branch, will cover the peninsular territory and also San Francisco. Frank Nerny will travel the San Joaquin valley with headquarters at Fresno while G. S. Patterson is located at Sacramento.

Akron Stock Prices

(Special Akron Correspondence)

A stiffening of prices on the Akron rubber stock market became more marked with the first trading of the new year. Goodyear common rose above the 20 mark and preferred held well over the 40 mark. Firestone common climbed toward 80 and Goodrich common headed for 40.

Portage common which had been notable among the weaker features, was stronger and holders asked 22.

There is a sentiment among investors which tends to the belief that rubber stocks will bring better prices in the near future. No sudden rise is expected—just a slow upward trend.

News of dividends declared by smaller companies casts a favorable reflection on stock transactions. The India Tire & Rubber Co. has declared a quarterly dividend of 1¾ per cent on preferred and 2 per cent of common stock, payable at once.

Quotations for Jan. 3 were:

	Bid	Asked
Amer. R. & T. com.	...	70
Amazon Rubber	...	45
Firestone T. & R. com.	75	80
do 6 pct. pfd.	76	80
do 7 pct. pfd.	66	70
General T. & R. com.	...	400
do 7 pct. pfd.	...	90
B. F. Goodrich com.	34	36
do 7 pct. pfd.	70	71
do 5 yr. 7 pct. pfd.	80	81
Goodyear T. & R. com.	19	21
do 7 pct. pfd.	42	44
India Rubber com.	...	130
do 8 pct. pfd.	...	80
Mason T. & R. com.	14	16
do 7 pct. pfd.	60	63
Marathon T. & R. com.	...	4
Miller Rubber com.	71	73
do 8 pct. pfd.	70	72
Mohawk Rubber	90	105
Portage Rubber com.	19	22
do 7 pct. pfd.	40	49
Republic Rubber com.	1¼	1½
do 7 pct. pfd.	...	40
do 8 pct. pfd.	20	22
Rubber Products	...	100
Star Rubber com.	...	100
do 8 pct. pfd.	...	100
Swinehart T. & R. com.	...	40
do 7 pct. pfd.	...	70
Phoenix Rub. com.	...	20
do pfd.	...	90
Standard Tire com.	...	125
do pfd.	...	90

Rubber Growers Bulletin

The following bulletin relating to the proposed reduction in the output of crude rubber was issued by the Rubber Growers' Association on December 15th, over the signature of Secretary Frank G. Smith:

1. CONTROL COMMITTEES.—With reference to the scheme for reduction of output which became operative on the 1st November, last, I am instructed to inform you that cable advice has been received from Ceylon intimating that a local committee of control has been formed to supervise the carrying out of the scheme. The Council approve the formation of this committee and have cabled to Ceylon requesting that details of how this Committee will operate be forwarded to Malaya and South India, with a recommendation that similar control committees should be established in those countries.

With regard to the Netherlands Indies, the Council of the A.V.R.O.S. have notified the International Association, The Hague, that they propose to appoint a control committee for Sumatra, and the Dutch Association have advised that they intend to request the Rubber Producenten Vereeniging at Batavia to appoint a similar committee for Java.

I am, therefore, directed to request that all producers who have signed forms of assent or advised that they are carrying out a policy of output reduction will authorise their representatives in the East to give every facility to these control committees to ensure the effective carrying out of the scheme.

2. FURTHER SUGGESTIONS.—Communications have been addressed to the Association advocating a more drastic policy of output reduction than that outlined in the Council's circular of 24th September.

At the present stage the Council cannot say whether the 25 per cent. will be sufficient to effect the desired reduction in stocks.

Certain companies have, however, definitely decided to adopt one or other of the following suggestions with a view to accelerating crop reduction:—

1. Application over whole estate of alternate day tapping without increasing length or number of cuts.
2. A total cessation of tapping for one, two, or three months particularly during the wintering period.
3. Abolition of tapping on Sundays and other holidays.

In forwarding these suggestions I am instructed to point out to all producers who have assented to the Council's scheme that there is nothing in their undertaking to preclude their adopting any of the above suggestions, provided it means an acceleration of their reduction in output and not a postponement.

QUESTIONNAIRE.—With reference to Forms Nos. 1 and 2, circulated on 6th November, the Council realise that much of the information required in Form No. 2 (Output Reduction) will have to be obtained from the East, and, therefore, there will be some delay; with regard to Form No. 1, however, those producers who have not furnished this information are urged to complete the Forms and return them without delay.

Brazilian Consular Invoices

As a result of the failure of American shippers to comply fully with regulations regarding Brazilian consular invoices, receivers of American goods at Brazilian ports are frequently subjected to fines and put to considerable trouble. This matter is called to the attention of the Chamber of Commerce of the United States in a communication just received from the American Chamber of Commerce at Sao Paulo, Brazil.

The Sao Paulo Chamber points out the necessity of giving complete information called for in each separate column of the Brazilian invoice form, specifying that the use of abbreviations results in a fine being imposed on the consignee. The letter reads:

"Consignors of merchandise are failing to write out the country of origin of the goods and the country where the goods are purchased in full, in each of the columns provided for that purpose on the consular invoice, and are abbreviating along the top of each column the name of the country of origin, "United States of America" or "Estados Unidos da America" to "U. S. A." or "E. U. da A." placing these initials across the two columns in question.

"This abbreviation is used of course, for convenience sake, but the consignees in Brazilian ports, on dispatching their goods, are fined because of abbreviation.

"We might also call your attention to the fact that the custom house officials discharging the goods receive fifty per cent of the fine levied on consignees taking their wares from the custom house, which fact encourages the fine for the slightest deviation from the Brazilian consular invoice regulations."

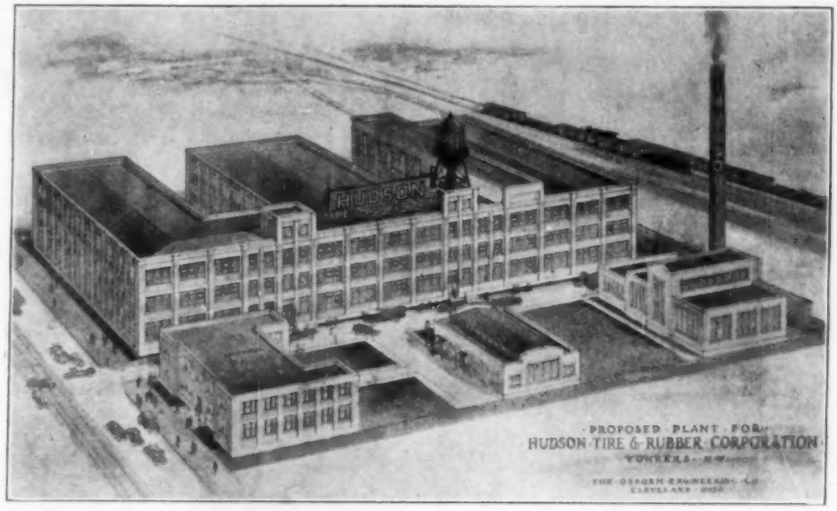
Advance Rubber Moves

The Advance Rubber Co. has announced its removal to its new plant 21-39 Gardner Ave., Brooklyn, N. Y.

Hudson Tire Builds

The contract for the factory of the Hudson Tire & Rubber Corporation, which will be erected on its site in Yonkers, New York, was awarded on November 12th, to James Mitchell, Inc., Jersey City, N. J., who have already started building operations. The Corporation owns about nine acres of land situated on the Putman Division of the New York Central Railroad, from which a spur track will be run for convenience in shipping.

The building was designed by and will be built under the supervision of the Osborn Engineering Company of Cleveland, Ohio, and is the latest development in a tire factory building. It will be reinforced concrete and steel throughout and adapted for extension as the business warrants. Only the latest and most efficient type of machinery will be installed, and the manufacture of the Hudson Non-skid cord tire in all sizes, including giants for heavy duty truck service and the Hudson solid truck tire will be under the supervision of experts already engaged. It is planned to have the factory running by April or May. The foundation for the building has already been completed.



PROPOSED PLANT OF HUDSON TIRE CORPORATION, YONKERS, N. Y.

The Hudson Non-skid cord tire is already being manufactured in the Corporation's molds by a responsible tire factory and has been pronounced as being excellent, both in appearance and quality. It will be manufactured in high-grade only. The capacity of the plant at the start will be 500 tires and 500 tubes daily this will be increased according to the capacity of the plant.

The officials of the corporation are W. M. Doucette, president, H. B. Seymour, vice-president and treasurer, and Ulrich Wiesendanger, secretary.

Goodrich Promotes Greenwood

C. S. Greenwood has been appointed branch manager of the Buffalo office of the B. F. Goodrich Co. He succeeds Walter S. Banks who has been placed in charge of Diamond tire sales in Buffalo district.

Rubber Association Issues Report

General Manager A. L. Viles Submits Annual Report to Members of the Organization—Many Recommendations Made for Coming Year—Formation of New Departments Advocated

The Rubber Association of America has recently issued to its members the annual report of the general manager. The report is divided into two parts: The first treats of activities of the organization during 1920; the second discusses the desired extension of organization and activities. The activities of the Rubber Association of America during the past year have been recorded by this publication so that to discuss the first part of the report would only be in the nature of reiteration. The second part, however, deals with something which has not as yet transpired and inasmuch as many of the recomendations are new to the trade they are herewith reproduced. The report of General Manager A. L. Viles says in part:

Part II of the Report

This part of your General Manager's report we should like to have given especial attention:

First, for the reason that the recommendations presented therein vitally concern the development of the Rubber Association to the point where it may favorably be compared with other trade organizations representing important industries which are competently serving as the medium for co-operative effort by the industry in all matters of interest. It is the belief of your Board of Directors and the General Manager that the time has come for the equipping of the Association with the needed facilities and organization tools to enable it to serve the interest of its members in a more effective manner than has been possible heretofore.

We believe that sufficient experience has been had with the potential advantage in Association work to prove the wisdom of attempting to cover the field more comprehensively and efficiently and that our organization and activities should be extended to a degree which will make the Association a more efficient and competent piece of commercial machinery.

We should like to have it kept in mind that the proposals for the broadening of the Association organization have developed as a result of the work of the activities of certain Divisions of the Association during the past year and that they are presented as the needed Association equipment for the carrying on of work which has, to a greater or less extent, already been started. In other words, they represent the natural development of interest in activities which have originated in nearly all cases with members of the Association and the proposals should not be misunderstood as representing an idealistic program or organization for which no real demand has become evident. In the instance of the recommended establishment of a publicity and an export department the question was given very careful consideration respectively by the Executive Committee of the Tire Manufacturers' Division and by that Committee jointly with the Executive Committee of the Foreign Trade Division and recommended by those bodies to the Board of Directors of the Association.

The Board of Directors has given consideration to those recommendations and in addition it has considered the other proposals which are presented in this report and recommends to Firm Members

A. L. Viles

of the Association that the Board of Directors be authorized to proceed with the desired extension of our organization and activities.

The second reason for careful attention to the following is found in the intimate relation which the suggested strengthening of the Association's position bears to the subject of Association finances as involved particularly in the amendment of Section 2, Article XI of the Constitution and By-Laws which has been recommended by the Board of Directors and is to be voted upon at the Annual Meeting on January 10, 1921.

The entire program presented in this report would involve an additional expense which, when added to the annual expenditures of the Association as at present operating, would very closely approximate the annual income from all sources which may reasonably be anticipated for the next two or three years, provided the present basis of contributions to the Association is continued. However, in spite of the fact that the development program would result in our using the entire annual income, we believe that it is so fundamentally sound in all its phases and will represent so satisfactory an investment that it should be proceeded with immediately. In this connection it is pertinent to state that the Rubber Association even with the enlarged organization suggested would represent an investment by the industry which is considerably less than that of other trade organizations representing other major industries, as for instance, the National Automobile Chamber of Commerce, American Paper and Pulp Association, American Hardware Mfrs. Association, The National Lumber Manufacturers' Association, and others.

The proposed amendment of the Constitution and By-Laws, if adopted, will in effect make permanent the equitable method of financing the Association which has been in operation for the last two years, under which manufacturing firm members have contributed to the Association in addition to the annual membership dues, an amount in proportion to the pounds of crude rubber purchased by them.

It is, therefore, with these two phases of the situation in mind that we wish to ask our members to carefully consider the suggestions presented in the following, which have the approval of your Board of Directors.

Organization of Export or Foreign Trade Department

The Executive Committee of the Foreign Trade Division and the Executive Committee of the Tire Manufacturers' Division recommended to the Board of Directors that the Association establish an export or foreign trade department in charge of a capable manager who might give his whole attention to the work. This recommendation was the result of consideration by the Tire Executive Committee of the service which might be rendered by such a department of the Association, particularly in connection with problems of the tire industry in foreign markets, notable among which is the subject of educational work in certain foreign countries in the interest of the straight side type of tire equipment as contrasted with the clincher type which is being vigorously promoted by manufacturers in Continental Europe.

Educational Work (Publicity) on Behalf of the Rubber Industry in General

The Executive Committee of the Tire Manufacturers' Division recommended to the Board of Directors that the Management be authorized to establish an educational (publicity) department in charge of a competent manager to devote his efforts to the preparation and dissemination of the right kind of publicity with respect to the rubber industry in general.

The recommendation emanated from the Executive Committee of the Tire Manufacturers' Division because the current situation in the tire manufacturing industry brought to the fore the desirability, if not, in fact, the absolute need for educational or publicity matter of a high caliber concerning the tire industry. This might be directed toward the education of the public mind concerning the origin and development of the automobile, highway

transportation and many related industries, and the steadily improving quality of the product as related to an actual lower cost to the consumer from year to year.

It is our belief that the industry needs to engage in this activity now, as perhaps, never before, if for no other reason than to offset publicity and press reports which are harmful because of inaccuracy, and exaggeration. However, ignoring this phase of the question, we believe that even under more favorable conditions there is a genuine need for constructive educational work in many directions, the aim of which would be to bring the rubber manufacturing industry before the general public in the most favorable light possible. In addition to this, however, there is, of course, an almost unlimited field for sales promotional efforts directed toward the development of certain rubber products and to the increased use of rubber for all possible purposes.

Cost Accounting

During the latter months of the year the subject of cost accounting has come to the fore as a result of greater familiarity on the part of the management and members with the advantages to be obtained from co-operative effort in that direction. The subject is one which has been found to be of the utmost importance in many industries in which the work was undertaken by the trade organization representing that industry and some very satisfactory results have been accomplished in all instances with which we are familiar. However, this fact alone would not warrant advocacy of a similar activity on the part of the Rubber Association unless there appeared to be a genuine need for the improvement of cost accounting conditions in our own industry. This we believe to be the situation after our observation and study of conditions during the past eighteen months, particularly with respect to some branches of the rubber industry.

The greater part of whatever benefit is derived from work of this sort is from the establishing of sound principles and fundamentals which may be used as a basis for the systems of all manufacturers in the same industry but which may be varied from to a greater or less extent as individual conditions seem to require. With that as a premise, one of the most common objections to the preparation of a uniform or standard system of cost finding or control for an industry is eliminated.

Another common objection is with respect to the additional expense involved in the maintenance of a more or less elaborate system of cost finding and control, and as to this we can say only that it is our belief that in the substantial majority of cases a uniform or standard system for an industry could be adopted by any manufacturer in that industry who had in operation a cost system, with very little or no additional expense to him. It is true that the determination of this depends largely upon the extent to which the individual company wishes to go into the detail of the subject and, of course, that phase of the matter must be considered and disposed of as an individual proposition. In those instances where no cost system is employed by the manufacturer, it is very probable that a system sufficient for the needs of the organization could be established and operated with but a slight additional expenditure.

It is obvious that a system of cost finding and control which does not represent an investment from which a satisfactory return is received in the form of greater efficiency and a more sound and profitable sales policy, is not worthy of its maintenance, and the subject of a uniform system of cost finding and control for any industry should be considered from that point of view.

A small start has been made by the Rubber Association in connection with cost accounting plans as a result of the action of the Rubber Proofers' Divison of this organization. That Division in the early Summer of 1920, after having carefully considered the subject, requested the Association to arrange for the preparation of a uniform plan of cost accounting which might be recommended to all members of the Division for their consideration and adoption if they so desired. The work was undertaken by a firm of public cost accountant and industrial engineers in Boston, who visited four proofing plants which were selected as representatives of all of the conditions to be found in the industry, and obtained at first-hand the information needed by them for the preparation of a system of cost finding and control which would be sound and efficient with respect to principles and fundamentals.

A report in much detail was rendered by the Boston firm and more elaboration was indulged in than might seem to have been necessary in order to present a thoroughly comprehensive plan which might be abridged to suit the individual conditions.

This report was considered by the Rubber Proofers' Division in the Fall and approved by a unanimous vote of the Division and recommended to all members for adoption under such conditions and at such time as their individual situation permitted. It is still too soon after the completion of the plan for much progress to have been made in the adoption of it either wholly, or in part, by members of the Division, but it is expected that the next few months will bring a new condition in this connection.

The suggestion that similar work be undertaken has been discussed by other Divisions of the Association but no definite conclusion has been reached in any instance.

It is the view of your management that all Association activities in connection with cost accounting can be most effectively handled only by the establishment of a properly representative Accounting Committee and a department in the Association organization in charge of an assistant experienced in cost accounting work for industrial groups. The activities of the department naturally will be subject to the direction of the Accounting Committee.

It is believed that such a department could give more close and more intelligent attention to the subject than it is possible for your present staff (who have not been trained for this work specifically) to do, and that such a department would be of inestimable value in assisting members in the installation of cost accounting systems in their offices when, and if, uniform systems are recommended and adopted. Such a department doubtless could be used advantageously by those members of the Rubber Proofers' Division who may desire to proceed with the installation of part or all of the plan of cost finding and control which has been prepared for that Division. The same condition would be true, of course, with reference to the work of other Divisions as they interested themselves in the subject.

We recognize that there often is a tendency to go into such detail with regard to a cost accounting system and to advocate the adoption of certain principles and methods, concerning which there is controversy and, perhaps, reasonable doubt as to the accuracy or efficacy of one versus the other, but we believe also that under the well considered direction of an Accounting Committee representing the industry the possible difficulties in this direction may be entirely avoided.

It is, therefore, with all angles of the subject in mind that the matter has been considered by your management, resulting in the presentation of a suggestion to the Board of Directors that a department in the Association be created to give its attention to the development of this work in the several branches of the industry. This, having been favorably considered, is recommended by your Board as a part of the general plan for the broadening of the Association's organization and activities.

Industrial Relations

The work of the Industrial Relations Executive Committee as cleared through the office of the Association during the past year has led to an appreciation of the many directions in which the activities of the Committee might conservatively and efficiently be extended. It is probable that the situation with respect to the industrial relations problem is considerably different than it was six months ago and just to what extent the present situation will alter the viewpoint of members of the Association in treating with the many angles of the subject is problematical.

However, it is the opinion of the Industrial Relations Executive Committee that even though conditions change materially, manufacturers will always be confronted with questions involving employment relations and that so long as that is true there will continue to be a service which the Rubber Association can render to its members in connection with their individual problems. It is our belief also that even under conditions most favorable to the employer interests there still exists a genuine need for a department in the Rubber Association in charge of an assistant, carefully selected for his qualifications and experience in industrial relations work.

The Industrial Relations Executive Committee should wish to be very careful not to advocate any particular plan or theory with respect to industrial relations and it is considered that the most effective work which could be done by an industrial relations department of the Association would be in the gathering and dissemination of accurate and timely information concerning employment conditions in various sections of the country and of such other information of all sorts as is available and interesting concerning industrial relations.

We should like to emphasize the fact that the establishment of a department in the Association organization to devote its attention to industrial relations, would not result in the promotion among members of the Association of elaborate plans for dealing with any of the phases of industrial relations work. The primary purpose of the recommendation is to provide a medium by which this subject (which is somewhat of a specialty requiring more particular attention than the present organization can give to it) can be more effectively handled, as an auxiliary to such work as is now being done by our members individually, but not to increase or extend it, nor to interfere with it in any way.

To this end, your Industrial Relations Executive Committee has recommended that the staff of the Association be augmented by the addition of an assistant to devote his attention to the subject of industrial relations under the direction of the Committee.

Research and Statistical Work

Operating with only a small staff, able to give but a limited amount of time to the development and study of statistics and other research work, the Association during the year has established beyond question the fact that there is a great opportunity for worth-while work in connection with the accumulation and dissemination of pertinent facts and figures of interest to the rubber industry.

These may be divided roughly into two classes: First, information from within the industry intimately concerning the direct interests of our members and, second, information concerning related industries and general commercial conditions, which will vary in their importance and relation to the rubber industry.

Like many other things, it is possible to carry activity in statistics and research to an excessive point, at which it becomes a burden upon the organization and is out of proportion to the benefit derived from it. In addition, the development of statistics covering too broad a field and going too much into detail imposes a burden upon the recipient of the information to the extent that he may be required to examine quantities of matter which will assay a relatively small proportion of authoritative and timely information.

With these facts in mind, however, the experience of your management during the past few months has led to the conclution, which we believe is well founded, that the Association staff should be broadened sufficiently by the addition of clerical help to permit of a greater amount of attention and time to be given to the development of information from within and from outside the rubber industry for the use of our members.

A very substantial start has been made in the development of statistics concerning the industry itself through the operation of a plan for the accumulation and dissemination at regular monthly intervals of data supplied by members of the Association respecting production, orders, cancellations, shipments, inventory, etc. of rain clothing, various kinds of proofed fabric (including auto topping), pneumatic tires, solid tires, inner tubes and the consumption of crude rubber and cotton fabric by the tire manufacturing industry. It is highly desirable, however, that we have the facilities for extending this work to cover other branches of the industry and perhaps eventually to amplify that which is now being done.

The availability of information of this character is important, not alone for its value to the manufacturers in the industry involved, but because it enables us to accurately and currently obtain the measure of the rubber industry as a whole and to study past conditions and estimate the future from a much more intelligent point of view than is otherwise possible. We have many times referred to the fact that reliable and comprehensive data concerning the rubber industry and its several component parts is extremely helpful and, in fact, some times absolutely necessary in connection with the handling of problems arising out of the action of Governmental bodies, as for instance the Treasury Department (with respect to taxes), proposed railroad freight rate legislation, etc., etc.

With reference to statistics and other information emanating from sources beyond the rubber industry, there will be need for very careful selection of the data of that character. However, much helpful information is available concerning the production of raw materials used by the rubber industry and commercial conditions in general, having an interesting bearing on the rubber industry, which might be properly correlated and presented in an intelligent manner for the benefit of our members.

It is from this point of view that the recommendation is made that the Association staff be enlarged sufficiently to permit of the development of this character of service to a reasonable and efficient degree.

Activities of a Technical Nature in Connection with Standardization of Product and Specification of Goods

The recommendation is made that there be added to the staff of the Association an assistant with some technical training in mechanical and chemical engineering who might handle more effectively than is now possible the detail connected with such subjects as concern standardization of product as to size, weights, etc., etc., and the detail connected with the work of the Mechanical Goods Specification Committee.

There have arisen many times problems in connection with subjects involving, for instance, tire standardization, in connection with which we have felt the need for the strengthening of the Association staff by the addition of an assistant to deal with the subjects from the more technical point of view which is sometimes essential. It is quite probable that a much more satisfactory working arrangement than now exists could be developed between this Association and, for instance, the Tire & Rim Association, the Society of Automotive Engineers, and other technical organizations with which we necessarily must have a certain amount of collaboration.

The same situation is true with respect to the technical detail involved in the work of the Specification Committee of the Mechanical Rubber Goods Manufacturers' Division and we believe that this work, while it is being limited to the improvement of existing specifications and does not contemplate the increasing of the number of rubber products for which specifications are written, could much more efficiently and effectively be dealt with if there were a small department in the Association organization which might devote closer and more intelligent attention to the subject.

The broadening of the Association to the extent suggested should not be misunderstood as contemplating increased activity in connection with the technical, chemical, or mechanical phases of rubber goods production nor research work of any character, for the reason that such an activity would be impracticable and would represent a duplication of work which so many of the individual factors in the industry are much better qualified to handle, because of their facilities for work of that character.

We should like to have it understood that there is involved in this recommendation only the matter of equipping the Association organization with the medium for handling work of a rather detail and routine nature which will doubtless continue to demand attention whether or not a department is established to handle it but which could so much more effectively and satisfactorily be handled by such a department.

Philadelphia Association Formed

The Rubber Association of Philadelphia has been organized by members of the Manufacturers' Club directly engaged in the rubber industry.

The following officers have been elected to serve for the ensuing year: President, William F. Metzger, Quaker City Rubber Company; vice-president, C. D. Garretson, Electric Hose & Rubber Company; secretary, D. P. Morgan; treasurer, Jacob R. Baltz, of William M. Moore Company, Inc., and the following additional members of the Executive Committee: F. L. Bacon, Gustin-Bacon Manufacturing Company; John Kearns, Lee Tire & Rubber Company; A. B. Means, United States Rubber Company, and H. D. Worthington, Hewitt Rubber Company of Pennsylvania.

MARKETS

Manufactured Rubber Goods

NEW YORK, JANUARY 5, 1921

While conditions in the markets for manufactured rubber goods are still far from normal, prominent members of the industry believe that the end to the long period of business depression is now in sight, and that by mid-summer of 1921 there will have been a distinct improvement throughout the entire country.

The smaller manufacturers have succeeded in getting rid of the greater part of their supplies of high cost raw materials, although it was found necessary to take some sharp losses during the process. The larger tire manufacturers have not yet succeeded in getting away from the incubus of high-priced crude rubber and cotton fabrics purchased early in 1919 on future contracts, when prices were at their highest levels.

As a result of this, the larger manufacturers will not be in a position to get down to production on present replacement costs until later in the year, when they will have passed out their finished products made from the high-cost raw materials. This is also true especially of the manufacturers of mechanicals, who have suffered considerably in the declines in prices on cotton fabrics and crude rubber. In the latter field manufacturing has been at a standstill for some time past.

The unprecedented slump in business which overtook the market towards the beginning of the third quarter of the year brought about such an uncertain condition in the industry that the usual method resorted to to stimulate consumption, price cutting, was not resorted to by the industry as a whole. While the smaller makers cut prices and moved out stocks, leading manufacturers realized that any competitive price cutting would be tantamount to business suicide, and so wisely withdrew from the market.

AUTOMOBILE TIRES

Estimates made during the closing days of 1920 placed the production of tires by all companies in the business at the rate of not over 6,000,000 tires per annum, or less than twenty per cent of the normal consumption of the country. The minimum consumption of the United States is figured at 30,000,000 tires.

According to figures compiled in the Boston fabric trade, the leading tire companies, including the five largest, have on hand, in transit, branches, or in factories, approximately 12,000,000 tires, about twice the normal stocks. Dealers' supplies on the other hand, are abnormally low, as the tendency in this quarter has been to curtail for months past.

Thus, the oversupply is apparently less than had been estimated in many quarters. With a continuance of the present open winter, and a normally early spring, leaders in the tire industry believe that by the beginning of the real touring season late in July or early in August, the demands from motorists will have eaten away the surplus, and manufacturing on a large scale can be resumed. Already, one large company has announced that it will resume operations this month, having been closed down since December 23 for inventory and repairs. The company in question will resume with three eight-hour shifts in the pneumatic tire, tube, and solid tire departments. Orders which have been accumulating since the plant shut down are expected to keep it in operation for some time to come.

MECHANICALS

Manufacturers of mechanical goods, who have had their factories closed down for some time past, owing to the unfavorable market for their products, are planning to resume on a small scale. Crude rubber prices have come down to a level which is proving attractive to the manufacturers, but the market for cotton fabrics still lacks stability, and the manufacturers of hose, belting, etc., are not buying save in a hand to mouth manner.

Demand for finished goods, hose, belting, packing, marine specialties, and so on, is reported as still quiet, but manufacturers are hoping for an improvement in conditions in the near future. Consumers have been out of the market for such a long time that they must be forced to shortly replace worn-out mechanicals is the opinion of manufacturers.

RUBBER FOOTWEAR

Manufacturers of sporting footwear are looking for a big season for spring, 1921. With prices on crude rubber, shoe ducks, and other raw materials down, and with the price of labor in the factories coming down, the manufacturers will be able to put their lines out this year at selling prices more in line with the anticipation of the buying public. The lowered prices at which the shoes can be sold is expected to bring about an improvement in demand. Sales of rubber heels have been picking up for some time past, and business is showing more activity with the beginning of the new year.

Cottons, Yarns and Fabrics

NEW YORK, JANUARY 5, 1921

The turn of the year has seen a little improvement in the market for cotton, bullish factors having had things all their way on the first trading day of the year.

Southern selling pressure, which has been insistent for some time past, is easing off a little, and the South is lining up on the buying side. Whether or not this change is merely a temporary one remains to be seen, but the withdrawal of Southern sellers from the market was a deciding factor and prices rose steadily. While January options closed December 31 at 14.34, the market on Monday closed at 15.50, an advance of 113 points.

Reports from dry goods centers in New England indicate that many of the mills are resuming operations, many on a full schedule basis, and the action of the mills in getting down somewhere near replacement cost in their selling prices is commented on favorably. It is believed that this lower price action of the mill interests will cause a marked improvement in the demand for their product, and with this will of course come a stronger market for raw cotton.

Japanese interests have been heavy sellers in the market thus far in the week, but this heavy selling has not precipitated any breaks as it has furnished the only supply for contracts.

Future prices on the New York Cotton Exchange are quoted as follows

NEW YORK FUTURE PRICES.

	Tuesday		
	High.	Low.	Close.
Jan.	15.65	14.95	14.97
Feb.	.....	.....	14.45 nom.
Mar.	14.80	14.00	14.05@14.10
April	.....	.....	14.05 nom.
May	14.90	14.09	14.14@14.22
June	.....	.....	14.20 nom.
July	14.90	14.20	14.20@14.25
Aug.	.....	.....	14.15 nom.
Sept.	.....	.....	14.20 nom.
Oct.	14.95	14.27	14.20@14.27
Nov.	.....	.....	14.30 nom.

Corresponding day in 1919: January, 37.70@37.75; February,36.60 bid; March, 36.07@36.10; April, 35.00 bid; May, 34.51@34.55; June, 34.40 bid; July, 32.90@32.94; August, 31.60 bid; September, 30.95 bid; October, 30.22; November, 39.90 bid; December, 29.60@29.70.

ARIZONA-EGYPTIAN COTTON

Offerings of Arizona long staple cotton are temporarily off the market, and growers are planning to hold their stocks until they can get what they consider a fair price for the product. Officials of the local growers association, which is affiliated with the American Cotton Growers' Association, are working steadily to keep the growers in line and to keep distress

lots of long staple cotton off the market. The growers have received enough financial assistance to enable them to pick and store their cotton. In the meantime, the plans for a drastic reduction in acreage are going forward. Private advices from the Southwest indicate that the crop of long staple cotton in Arizona and California will be important this year, and that the quality is high.

EGYPTIAN COTTON

Growers of Egyptian cotton are very apprehensive over the outlook for the new year. The United States, a big buyer during the past three years especially, is not expected to be an active factor in this year's market. The heavy sales of Egyptian cotton to the United States during the past year are said to have resulted in overstocking. Due to the low prices paid on account of early contracts, American buyers were enabled to resell some of this cotton to Liverpool, realizing handsome profits. Despite this, however, the balance of Egyptian staple remaining in the United States is believed to be considerable, and to add to this, a good crop of domestic long staple is assured.

TIRE FABRICS

Second hands continue in control of the spot market yet, and leading producers continue to keep their quotations withdrawn, booking business only by individual agreements on each sale. With the rubber tire industry planning to resume operations on a larger scale, however, the spinners are taking more interest in things, and it is probable that the resumption of tire manuacturing will see a revival in the tire fabric trade.

HOSE AND BELTING FABRICS

Inside prices on ducks have again been lowered, and the market is still on the downward move. Manufacturers are consequently keeping out of the market, and no real resumption is looked for until the market becomes more stabilized. While production is greatly curtailed, the surplus stocks produced during the past years are still a drug on the market, and are factors in the steady decline. Revised quotations are given in the appended table.

DRILLS, SHEETINGS AND OSNABURGS

Leading manufacturers are announcing prices to rule on spring cotton goods, the new prices being substantially lower than those last named by the producers. One large concern has named its prices, effective January 4, and others are expected to follow almost immediately. Buyers who put in orders during the fall for the goods produced by this particular firm will be rebated if they have paid their bills calling for higher prices. Buying of spot goods has been quiet for the past fortnight, with the market weak, and the price trend downward.

TIRE FABRICS

17¼-ounce Sea Island, combed, sq. yd.	Nominal		
17¼-ounce Egyptian, combed	—	@	—
17¼-ounce Egyptian, carded	—	@	—
17¼-ounce Peelers, carded	—	@	—
17¼-ounce Peelers, combed	—	@	—

DUCKS

Belting (pound basis) lb.	.38	@	—
Hose (pound basis) lb.	.38	@	—
*Enameling lb.	.40	@	.45
Shoe Ducks lb.	.44	@	—
Single filling yd.	.14	@	.18
Double filling yd.	.20	@	—

*Price varies according to width.

DRILLS

37-inch 3.25-yard yd.	.10¾	@	—
37-inch 2.75-yard yd.	.13	@	—
37-inch 3.00-yard yd.	.11	@	.11½
37-inch 3.50-yard yd.	.10	@	—
37-inch 3.95-yard yd.	.09½	@	—

OSNANBURGS

30-inch 7-ounce	.10	@	—
40-inch 7-ounce	.11	@	—

SHEETINGS

40-inch 2.35-yard yd.	Nominal		
40-inch 2.50-yard yd.	.12½	@	—
40-inch 2.85-yard yd.	—	@	—
40-inch 3.15-yard yd.	.12	@	.13
40-inch 3.60-yard yd.	.09	@	.09½
40-inch 3.75-yard yd.	.09	@	—
40-inch 4.25-yard yd.	.08½	@	.08½

Note—In view of the unsettled conditions prevailing in the market at the present time, the prices quoted above are more or less nominal, and are not guaranteed.

BURLAPS
(Carload Lots)

7 -ounce 40-inch	——	@	——
7½-ounce 40-inch	——	@	——
7½-ounce 45 inch	4.15	@	——
8 -ounce 40-inch	4.25	@	5.50
8½-ounce 40-inch	——	@	——
10 -ounce 36-inch	——	@	——
10 -ounce 40-inch	Nominal		
10 -ounce 45-inch	Nominal		
10½-ounce 40-inch	5.00	@	——

* And higher, according to width.

Chemicals and Compounding Materials

NEW YORK, JANUARY 5, 1921

Price declines in this branch of the market have not yet been checked, and fractional revisions downward are of almost daily occurrence. The continued absence of heavy buying interest is still making itself felt, and while producers and dealers talk of a turn for the better when the spring months arrive, they cannot do business on expectations, and are being forced to get their prices in line with buyers's ideas.

Despite all of these reduction, however, the market has not declined in proportion to drops in cotton fabrics and crude rubber. Discussing this angle, a prominent chemical manufacturer said; "Even the rubber tire trade is not immune from the panicky feeling caused by the big drop in cotton from a 40 cent basis to something under 15 cents. The rubber tire trade is consequently trying to obtain dyestuffs at a reduction commensurate with the decline in the raw materials which they use in the manufacture of auto and truck tires."

Whether or not the tire trade can get lower prices on the materials which it uses is by no means improbable. Continued absence of buying support from the market is bound to cause reductions, and thus far there have been no new factors in the market which might be construed as favorable to higher prices.

EXPORTS AND IMPORTS

Imports of chemicals and compounding materials from Europe are proving a thorn in the side of the domestic manufacturers. This condition is expected to be further aggravated when President-elect Harding takes office. It is believed that one of the first acts of the Republican administration will be to end the state of war now existing with Germany. This action, it is pointed out, will release a flood of German dyes and chemical products to this market, which will demoralize the domestic situation unless tariff protection measures are promptly adopted.

Export buying has shown comparatively little activity during the past fortnight, business being of a routine nature throughout.

LITHARGE

The market for litharge has been neglected during the past two weeks, buyers being practically out of the market during the inventory period. Stocks in the hands of producers are now ample to take care of current requirements of the trade. In kegs, the market is quoted on the basis of 14 cents per pound.

LITHOPONE

Although domestic producers predict higher prices on lithopone when spring buying sets in, the present market is held quotably unchanged on the basis of 7¾ cents per pound for lithopone in bags, with barreled stock quoted at 8 cents per pound, both carlot figures. A premium of ¼ cent per pound is asked for less than carlots.

WHITING

There have been no developments of general interest in the whiting market, and manufacturers report a routine inquiry for all grades. Consumers are taking stocks only as needed, and are not inclined to stock up ahead.

BARYTES

While little new business has come to the producers of barytes during the holiday fortnight, they have been kept fairly busy in filling back orders, and turning aside stocks for their surplus reserve. Thus far, the imports of foreign barytes have not cut into the business of American producers to any great extent, and the domestic trade expects to get the lion's share of 1921 business.

ZINC OXIDE

Buying of zinc oxide by the automobile tire trade is not showing much activity as yet, but producers are looking for a better demand during the spring months, when it is believed that the tire industry will get under way once again on a larger scale.

DRY COLORS

A little business in carbon gas blacks is reported following reductions to 10 to 20 cents per pound. Lampblack is reported as quiet at 16 to 48 cents per pound. Activities in other blacks are restricted to the filling of small orders. Red oxide has shown a decline, domestic natural in casks offering at 2 cents per pound, with Spanish at 5½ cents. Toluidine was lower at 3½ cents. Little activity in the market for yellows is noted. Browns hold generally quiet, although raw Italian sienna in barrels is a little firmer at 10 cents. Blues are quiet and nominally unchanged.

CRUDES

Benzol is showing further weakness; prices having declined on both 90 per cent and pure. Naptha is dull and nominally held. Little buying of toluol is reported, and the market is held at 30 to 36 cents per gallon for the pure. Xylol shows little activity.

INTERMEDIATES

Producers are holding technical acetanilid at 35 to 40 cents per pound, but this price can be beaten by 3 or 4 cents in second hands. Aniline oil, in contrast to other materials, has advanced, being held at 23 to 25 cents per pound. Benzidine base holds at 95 cents to $1.00 per pound under light demand. Betanapthol is likewise quiet and unchanged. Dinitrobenzol is offering liberally at 25 to 27 cents per pound, with little buying interest being displayed. Paraphenylenediamine is quoted nominally at $2.00 to $2.25 per pound, with trading quiet.

Current Prices for Chemicals, Fillers, Colors, etc.

Acetone, carlots	.lb.	.13 @	—
Acetanilid, C. P., bbls	.lb.	.25 @	.40
Acetone smaller lots	.lb.	.13½ @	.14
Acids, Acetic, 56 per cwt.	cwt.	— @	—
Carbolic, C. P.	.lb.	.09 @	.12
Muiatic, 20 deg.	cwt.	1.85 @	2.00
Muriatic, 22 deg.	cwt.	2.50 @	3.00
Nitric, 40 deg.	cwt.	7.00 @	7.50
Nitric, 42 deg.	cwt.	7.50 @	8.00
Sulphuric, 60 deg. car lots	tons	13.00 @	15.00
Sulphuric, 60 deg. car boys		21.00 @	—
Tartaric, crystals	.lb.	.48 @	—
Albalith		.07¾ @	.08¼
Aluminum Silicate		Nominal	
Aniline oil, bulk basis Contract		— @	—
Imported		Nominal	
Domestic		.23 @	.25
Antimony— Oxide	.lb.	.07½ @	.09
Sulphuret, red	.lb.	.25 @	.30
Sulphuret, golden	.lb.	.28 @	.30
Sulphuret, crimson	.lb.	.45 @	.48
Alcohol, denatured, 190 proof		— @	—
Wood, 95 per cent.		1.90 @	1.95
Ethyl, 190 proof		5.10 @	5.15
Aldehyde, Ammonia		Nominal	
Ammonia, powdered		.15¾ @	.16
Ammonium Carbonate, domestic	.lb.	.15¾ @	.16
Amyl Acetate	gal.	3.75 @	3.80
Anthracene 80 per cent		.80 @	.85
Anthroquinine, 95 per cent		1.85 @	2.00
Asbestine		Nominal	
Asphaltum, Egyptian	.lb.	.20 @	.25
Domestic	ton	.30 @	.40
Barium, dust	.lb.	.06 @	—
Barytes, prime white imported	ton	Nominal	
white, domestic	ton	32.00 @	38.00
off-color, domestic	.lb.	20.00 @	28.10
Southern, f. o. b. mills		23.50 @	25.00
Western, f. o. b. mills		23.50 @	26.00
Beeswax		.18 @	.54
Benzidine Base	.lb.	.95 @	1.00
Benzol, 90 per cent		.28 @	.34
Benzol, pure bulk, 100		.30 @	.36
Blanc Fixe, dry, bbls.	.lb.	.05½ @	.05¾
Burgundy Pitch, dom.	.lb.	.06½ @	.07
Foreign		.60 @	.65
Blacks, Drop	.lb.	.07½ @	.16
Ivory	.lb.	.18 @	.25
Carbon, gas, cases	lb.	.10 @	.20
Lampblack, R. M.	.lb.	.16 @	.48
Mineral blacks	ton	35.00 @	45.00
Blues, Prussian		.82 @	—
Soluble	.lb.	.82 @	—
Ultramarine	.lb.	.15 @	.35
Browns, Umber, Turkey, burnt powdered	.lb.	.05½ @	.07
American, burnt,	.lb.	.04½ @	.05
Cadmium, sulphide, yellow	lb.	1.40 @	1.45
Carbon, Disulphide, bulk	lb.	— @	—
Bisulphide	.lb.	.08½ @	.09
Casein, C. P.	.lb.	.45 @	.48
Castor Oil		.11½ @	.13
Caustic Soda, 76 per ct.	cwt.	3.50 @	3.75
Chalk, precipated, extra light	.lb.	.05 @	.05½
heavy	.lb.	.03¾ @	.04
China clay, domestic	ton	10.00 @	12.00
imported	ton	16.00 @	18.00
China Wood Oil, bbl.	.lb.	.10½ @	.11½
F. o. b. Pacific Coast		.09 @	.09¾
Chloroform, U. S. P.		.43 @	.45
Clay, Dixie	ton	22.00 @	—
Blue Ridge	ton	22.00 @	—
Coal Tar Pitch		— @	—
Cottonsed Oil, crude, f. o. b. mills	.lb.	6.00 @	—
Prime summer yellow	bbls.	8.00 @	—
		.09½ @	.10
Dimethylaniline	.lb.	.60 @	.70
Elateron		— @	—
Formaldehyde, spot	.lb.	.18½ @	.27
Fullers Earth, powd., carload lots		17.00 @	20.00
Fossil flour	.lb.	— @	—
Genasco Mineral Rubber		— @	—
Gilsonite	ton	60.00 @	65.00
Glue, extra white	.lb	.35 @	.45
medium	.lb.	.29 @	.34
low grade		.21 @	.25
foot stock		.18 @	.21
brown foots		.18 @	.22
common bone		.17 @	.20
Glycerine, C. P. (drums)	lb.	.20 @	.21
cans		.22 @	.23
Graphite, flake (bbl.)	.lb.	.14 @	.20
powdered (bbl.)	.lb.	.04 @	.10
Green, chrome, R. M.	.lb.	.40 @	.68
Ground glass (fine)	.lb.	.03½ @	.04
Hexamethylene	.lb.	1.25 @	1.30
Hexamethyenetramine	.lb.	1.20 @	1.30
Infusorial earth, powd'd.	.lb.	.02 @	.035
bolted	.lb.	.035 @	—
Iron ovide, red, reduced grades	.lb.	.13 @	.15
red, pure, bright	.lb.	— @	—
Kaolin		— @	—
Lime, hydrated		— @	—
Lead, red dry (casks)	.lb.	.10¼ @	.10½
sublimed	.lb.	— @	—
white, basic carb	.lb.	.09 @	.09½
white, basic sulp.	.lb.	.08¼ @	.08½
Lime flour	.lb.	— @	—
Litharge .(casks)	.lb.	.09¾ @	.10
English	.lb.	— @	—
Lithopone, domestic, bbls.	.lb.	.08 @	—
in bags	.lb.	.07¾ @	—
M. R. X.		— @	—
Magnesia, carbonate	.lb.	.15 @	.17
calcined light	.lb.	.60 @	.65
Magnesite, calcined, pwd.	ton	50.00 @	65.00
Magnesia, Oxide, heavy		— @	—
Light		— @	—
Extra light		— @	—
Napthalene	.lb.	.07¾ @	.10
Nitrobenzol		.12 @	.14
Naphtha, motor gasoline, (steel bbls.)	gal.	.31 @	—
68 @ 70 degrees (steel bbls.)	gal.	.38 @	—
70 @ 72 degrees (steel bbls.)	gal.	.39 @	—
73 @ 76 degrees (steel bbls.)	gal.	.41 @	—
machine (steel bls.)	gal.	.50 @	—
Oil, corn, crude factory	cwt.	9.01 @	—
corn, ref. (bbls.)	cwt.	12.26 @	—
linseed, (bbls.)		.83 @	—
In carloads, spot		.80 @	—
Tank cars		.79 @	.81
Oil palm, Lagos	.lb.	.07¾ @	—
Niger		.07¼ @	—
Pine, yellow	gal.	1.45 @	1.50
Distilled	gal.	1.50 @	1.60
Rapseed, refined	gal.	1.15 @	—
Rapseed, blown	gal.	1.25 @	—
Rosin, first rectified	gal.	.60 @	—
Second, run		.63 @	—
Tar (commercial)	gal.	.43 @	—
Oleum Acid, 20 per ct.	ton	22.00 @	25.00
Orange mineral, Amer.	.lb.	.13¼ @	.16
Imported	.lb.	Nominal	
Ozokerite		Nominal	
Paraphenylenediamine	.lb.	2.00 @	2.25
Petrolatum, bbls., amber	.lb.	.08 @	—
Pale yellow	.lb.	.07½ @	.08½
Parafin, refined, 118 @ 120 m. p.		.08¾ @	.09
127 @ 129 m. p.		.09¾ @	.10¼
137 @ 140 m. p.		.11 @	.11½
Phenol		.09½ @	.12
Pumis		.03 @	.08
Pine tar kiln	bbl.	14.50 @	15.00
Pitch	bbl.	9.50 @	10.00
Plaster of paris	bbl.	4.25 @	5.00
Red Tuscan	.lb.	.15 @	.25
Red (American)	.lb.	.14 @	.16
Indian (English)		.14 @	.16½
Standard	.lb.	— @	—
Rosin (common to good)— 280 lbs.		8.50 @	—
Rotten stone, powdered	.lb.	.02½ @	.04½
Rubber, substitute, black	lb.	— @	—
White	.lb.	— @	—
Brown		— @	—
Mineral, Hard Hydrocarbon	ton	42.00 @	—
Rosin Oil, first rectified		.60 @	—
Second rectified		.63 @	—
Third rectified		.70 @	—
Fourth rectified		.85 @	—
Soda ash, light 58 pct.	cwt.	1.80 @	2.00
Sodium Nitrite 96 @ 98 pct.		.16 @	.17½
Solvent Naptha, crude, hvy.		.28 @	.34
Soya Bean Oil, bbls.	.lb.	.08½ @	.09½
Sellers, tanks, f. o. b. Coast		.05¾ @	—
Stearic Acid, single		.13 @	.13½
Shellac, fine orange	.lb	.86 @	.87
Sulphur Chloride, drums		.06½ @	.16
Shellac T. N.	.lb.	.77 @	.78
Bleached, ordinary	.lb.	.74 @	.75
Bleached, boendry	.lb.	.89 @	.90
Silex (silicia)	ton	25.00 @	40.00
Soapstone, powdered	ton	15.00 @	20.00
Starch, corn, powd.	cwt.	2.93 @	3.41
Pearl		2.83 @	3.31
Jap potato, duty pd.	.lb.	.05½ @	—
Sulphur, crude	ton	— @	—
100 pounds		— @	—
Roll		2.85 @	2.95
Commercial superfine		2.10 @	2.75
Talc, American	ton	18.00 @	20.00
French	ton	30.00 @	36.00
Thiocarbanilid		— @	—
Tolulol, pure, in drums,	gal.	.30 @	.36
Commercial		.30 @	.32
Tripolite earth	.lb.	.01½ @	—
Turpentine, pure gum— Spirit	gal.	.75 @	.76
Wood	gal.	.69 @	.71
Venice, artificial	gal.	.15 @	.18
True		2.85 @	3.00
Vermillion, English	.lb.	1.00 @	1.10
American		.25 @	.30
Vorite		Nominal	
Wax, beeswax, crude, yel. lb.		.21 @	.22
Refined		.27 @	.28
Bayberry		.30 @	.32
Ceresin, white	.lb.	.14 @	.15
Yellow		.13 @	.14
Whiting, commercial	cwt.	1.40 @	—
Gilders Bolted		1.45 @	—
Paris, white Amer.	cwt.	1.50 @	1.60
English ,cliffstone	cwt.	2.00 @	—
Quaker	ton	15.00 @	—
Xylol (gal) pure		.42 @	.45
Commercial		.35 @	.35
Zinc Oxide, French process Red Seal		.10¾ @	.11¼
Green seal		.11¾ @	.12¼
White seal		.13 @	.13¼
Leaded Grades— Commercial, lead free		.09½ @	.10
5 per ct. lead sulphate		.08½ @	.09
10 per ct. lead sulphate		.08¾ @	.08⅞
20 per ct. lead sulphate		.08¼ @	.08¾
35 per ct. lead sulphate		.08⅛ @	.08⅝
Zinc Sulphate		.03¼ @	.03½

Crude Rubber

NEW YORK, JANUARY 5, 1921

After having passed through what was probably the most disastrous year in its experience, the crude rubber market is once again getting upon its feet, and members of the trade profess to see a brighter outlook for the year 1921.

This confidence in the future is aptly summed up by one well-known broker, who said; "In the process of liquidating a large number of insolvent accounts the volume of unsold rubber thrown upon the market in the past year has a disastrous effect upon price schedules, and values declined from above 50 cents a pound on spot rubber, to the present price of 15½ cents—the lowest in the history of the industry. However, with the majority of these dead accounts out of the way as they now are, and with tire manufacturers regaining lost confidence in the situation, I think things will begin to look considerably brighter as early as March of next year and that twelve more months will find prices shaping up to normal."

These views on the market situation are shared by other members of the industry, who express confidence in the outlook. The market has a long road to travel, however, as the declines during the year were very severe on all varieties. The following table, including most of the principal varieties, is given to show the extent of these breaks;

	Cents per Pound Jan. 1, 1920.		Jan. 1, 1921.		
Para up river coarse	36½	@	37	13	@ ..
Up river medium	48	@	49	14	@ ..
Up river fine	50	@	51	17½	@ ..
Islands fine	47½	@ ..		16	@ ..
Cameta	22½	@ ..		12	@ ..
Caucho ball	35	@ ..		13	@ ..
Ceylon, first latex crepe	55	@ ..		17	@ ..
Smoked sheets ribbed	55	@ ..		16	@ ..
Smoked sheets plain	53	@ ..		14	@ ..
Centrals,					
Corinto	34	@ ..		14	@ ..
Esmeralda	34	@ ..		14	@ ..
Balata block Panama	57	@ ..		28	@ ..
Prime Surinam sheets	$1.02	@ ..		69	@ ..
Palembang	14	@ ..		6½	@ ..
Pontianac, prime	15	@ ..		6	@ ..

Many members of the trade believe that the turning point in the market was reached at the close of the year 1920. These believe that prices are now at the low ebb, and that advances to higher levels are to be looked for during the new year.

Cables received from London during the week state that trading there has shown a decided turn for the better, and this strength in part has manifested itself here, where holders having shown themselves less willing to make sales at prevailing low prices. Some small lots are being released to manufacturers at quoted prices, but the volume of such transactions is not heavy.

Manufacturers other than those engaged in the production of tires are beginning to show interest in the market. Inquiries are becoming more general, and brokers report that other industrial users are slowly but surely increasing their orders, and showing less trepidation in taking stocks others than those urgently needed at their factories.

Tire manufacturers are resuming operations on a larger scale, but are not ready to buy in large quantities, although they are allowing stocks of crude rubber which have been held in New York for their account to come forward more freely. The tire manufacturers were caught in the slump, many having contracted for forward deliveries at very high prices before the market broke. These latter have not yet cleared all of their supplies of high-cost rubber, although many averaged up and minimized their losses by putting their stocks on the resale market before prices reached their present low levels.

Importers and brokers quote the market for spot rubber as follows;

Ceylons			
Smoked sheets, ribbed, spot	.16	@	—
Smoked sheets ribbed Jan. Mch.	.16½	@	—
Smoked sheets ribbed Jan. June	.17	@	—
Smoked sheet plain, spot	.14	@	—
First latex pale crepe	.17	@	—
Amber crepe, No. 1	.13	@	—
Amber crepe, No. 2	.12	@	—
Amber crepe, No. 3	.11	@	—
Clean brown crepe	.11	@	—
Light clean brown crepe	—	@	—
Roll brown crepe	.11	@	—
Grand Central crepe	.11	@	.11½
Africans			
Rio Nuna string	—	@	—
*No. 1 Benbuella	.11	@	—
*No. 2 Benbuella	.08½	@	—
Paras			
Up river fine	.17½	@	—
Up-river medium	.14	@	—
Up-river coarse	.13	@	—
Caucho ball	.13	@	—
Islands fine	.16	@	—
Maderia fine	—	@	—
Cameta	.12	@	—
Knapsack	Nominal		
Centrals			
Corinto prime	.14	@	—
Esmerelda prime	.14	@	—
Miscellaneous			
Guayule wet	—	@	—
*Balata block Panama	.28	@	—
Balata sheets	.69	@	—
Palembang	.06½	@	—
Bangermassin	.06	@	—
Columbian Block Balata	.46	@	—
Prime Pontianac	.06	@	—

* Nominal

Scrap Rubber

NEW YORK, JANUARY 5, 1921

The turn of the year has brought with it no cheering prospects for dealers in scrap rubber, and the market is in a demoralized condition throughout. Stocks of scrap continue to pile up in the hands of the wholesalers, and with practically no outlet for the goods already on hand, the wholesalers are in a quandry as to methods to dispose of their supplies.

Scrap dealers are keeping a close watch on the market for crude rubber, and are hoping for an early turn in the market for the crude, feeling that any advance in the price of the latter would bring about a marked improvement in demand for the scrap stock, and a resultant bettering of their own market.

Reclaimers show no interest in the offerings of the jobbers even price cuts having now lost their glamour. The reclaimers are not doing much on their end of the game, being likewise affected by the low market ruling on crude rubber. When any business comes in, the reclaimers either take care of their orders from stocks on hand, or come into the wholesale market for just enough stocks to take care of the immediate business in hand.

While no quoted changes in prices have been made, the market is on a nominal basis, and no grades have any fixed value.

	Cents	per	Pound
Solid Tires	1.50	@	2.00
Auto Tire Peelings	2.50	@	2.75
Truck Tires	2.00	@	2.25
Black Rubber	1.50	@	2.00
Boots and Shoes	4.25	@	4.50
Arctics, trimmed	3.25	@	4.50
Arctics, untrimmed	—	@	—
Tire—Automobile	1.00	@	1.25
Bicycles, pneumatic	1.00	@	1.50
Mixed Hose	.50	@	1.00
Air Brake	1.50	@	—
Inner Tubes, No. 1	8.00	@	8.50
Inner Tubes, No. 2	5.50	@	6.50
Red Tubes	4.00	@	5.00

New Feature of Bolton Cutter

A feature of much practical value has recently been added to the Bolton Vertical Bias Cutter in the form of a perfected "take off" which receives the fabric strips as they are cut by the machine, and automatically places them in books or wind-up if books are not desired. It is claimed that even with the "take off" the cutter still occupies a minimum of floor space and increases the efficiency of bias cutting since it produces a great saving in labor and expense. Spadone Machine Co. 126 Duane Street, New York.

India Declares Dividend

The India Tire & Rubber Co., Akron, Ohio, has declared a quarterly dividend payable January 3, 1921 of 1¾ per cent on its preferred stock and 2 per cent on its common stock.

Boston Woven Hose Statement

The Boston Woven Hose & Rubber Company, Cambridge, Mass., has issued a financial statement as of August 31, 1920. The statement gives total assets of $10,448,348 as compared to $7,340,409 of a year ago. Merchandise is $4,926,299 as against $2,675,255 of a year ago while cash and debts receivable are $2,506,938 compared to $1,809,192 for the year before. Accounts and notes payable are given at $3,336,352 compared to $1,460,026 while the surplus is recorded as being $2,161,996 against $2,030,383 for the previous year.

Keystone Passes Dividend

Directors of Keystone Tire Co. have decided to omit quarterly dividend of 3 per cent due at this time, in order to conserve cash resources and make it possible for the company to take advantage of present low prices of crude rubber and cotton fabric.

Since the latter part of 1916 quarterly dividends of 3 per cent have been paid on the common. In 1918 a stock dividend of 33 1/3 per cent was declared, followed by two stock dividends of 15 per cent each in March and July last year.

American Rubber Patents

ISSUED DECEMBER 21, 1920

1,362,594— To Julius J. Berger and John Gardner, Union Hill, N. J. Mold for pneumatic tires.

1,362,640—To Fred Thomas Roberts, Cleveland, Ohio. Method of making hollow rubber articles.

1,362,654—To Henry G. Voight, New Haven, Conn. Tire-carrier.

1,362,714—To Charles D. McCollough, Des Moines, Iowa. Core for resilient tires.

1,362,717—To Joseph A. McLane, Morgantown, W. Va., assignor to the Armorcord Rubber Co., Morgantown, W. Va. Attachment for tire and tube molds.

1,362,731—To Frank A. Nagel, Cicero, Ill. Tire-filler.

1,362,774—To Archie Edwards Brown, El Paso, Texas. Tire.

1,362,979—To John G. Wolfe, Chicago, Ill. Shoe for pneumatic tires.

1,363,109—To Walter S. Gillette, Bay City, Texas. Tire-core.

1,363,150—To John H. Mulloy, Detroit, Mich., assignor to Morgan & Wright. Tire-mold and clamp.

1,363,163—To Carl Nickum, Zion, Ill. Tire-repair tool.

1,363,175—To Ida V. Benoit, Brooklyn, N. Y. Automobile-tire chain.

Data for Technical Men

The R. T. Vanderbilt Co., 50 East 42nd. St., New York City, has recently issued interesting data to the technical men of the rubber industry. This data is in the form of book sheets in loose leaf form for insertion in pocket-size note books. The sheets contain data on accelerators, conversion tables for the tensile strength of rubber compounds and for weights and measures. In addition to the foregoing there is information on tire inflation schedules; comparative prices for fabric from pound to square yard and vice versa; testing sieves; pressure gauges, saturated steam, solvents and miscellaneous liquids in compact form for the reader. Condensed data on accelerators and loose leaves descriptive of the Vanderbilt products are also given. These book sheets will undoubtedly prove of considerable value to all rubber men by virtue of the interesting data contained in such compact form.